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RECRUITMENT AND RETENTION OF TALENTED COLLEGE STUDENTS.
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A VARIETY OF RECRUITING, TRAINING, AND ENVIRONMENTAL INCENTIVE FACTORS WERE STUDIED AS THEY RELATE TO COLLEGE MOTIVATION AMONG TALENTED HIGH SCHOOL STUDENTS AND TO SCIENTIFIC PRODUCTIVITY AND INTELLECTUAL ACHIEVEMENT AFTER A STUDENT HAS ENTERED COLLEGE. FOR THIS PURPOSE A FOLLOWUP STUDY WAS MADE OF A 10 PERCENT RANDOM SAMPLE OF HIGH SCHOOL GRADUATES, SELECTED FROM SOME 300,000 EXAMINEES WHO HAD MADE GOOD SCORES ON THE NATIONAL MERIT SCHOLARSHIP QUALIFYING TEST WHILE IN HIGH SCHOOL. THE SAMPLE, INCLUDING THOSE WHO ENROLLED IN COLLEGE AND THOSE WHO DID NOT, WAS EXAMINED COMPARATIVELY WITH RESPECT TO ASPIRATIONS, BACKGROUNDS, APTITUDES, AND OTHER PERSONAL CHARACTERISTICS. COMPARISONS WERE ALSO MADE BETWEEN THOSE SUBJECTS WHO HAD RECEIVED OR HAD BEEN OFFERED SCHOLARSHIPS AND LOANS AND THOSE WHO HAD NOT. IN ADDITION, SCALES WERE CONSTRUCTED FOR ASSESSING COLLEGE ENVIRONMENTS AND FOR DEFINING VARIABLES FOR STIMULATING ACHIEVEMENT IN HIGHER EDUCATION. AN INTERESTING FINDING WAS THAT OVER 75 PERCENT OF THAT PART OF THE SAMPLE WHO HAD NOT GONE TO COLLEGE COULD HAVE BEEN RECRUITED INTO COLLEGE IF EARLIER INCENTIVES HAD BEEN PROVIDED BEFORE THEIR NEGATIVE DECISIONS TOWARD HIGHER EDUCATION WERE MADE. RESULTS ALSO SHOWED THAT SCHOLARSHIPS AND LOANS CAN BE A SIGNIFICANT INCENTIVE IN OVERCOMING AND EXTREMELY COMMON REASON FOR NOT GOING TO COLLEGE - FINANCIAL DIFFICULTY. METHODS WERE CITED FOR COLLEGE DROPOUT PREVENTION AMONG ABLE STUDENTS. (JH)

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by

Donald L. Thistlethwaite

Vanderbilt University

January, 1963

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VANDERBILT UNIVERSITY

Recruitment and Retention of Talented College Students

Final Report of Factors Influencing the Recruitment and Training of Intellectually Talented Students in Higher Educational Programs

carried out under a contract with
United States Office of Education

January, 1963

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Chapter 1

INTRODUCTION

Institutions of higher learning provide opportunities for the development of talent which cannot be obtained elsewhere. Yet large numbers of our most capable youth discontinue their education after high school, never setting foot on a campus, and even among college entrants ranking in the upper 30 per cent of ability the chances of remaining and obtaining the Baccalaureate are only about two in three. The problem of "talent loss," both between high school and college and during the college years, has received renewed attention by educators and scientists since Sputnik I, and has led to the demand for the creation of a national policy of talent development.

Justification for the development of knowledge about factors contributing to talent loss and the means of reducing this loss can readily be derived from the "race for survival" posed by Russian technological advances. But, perhaps a more fundamental reason for concern about talent loss is one based upon our commitment to the ideals of a free, democratic society. As Dael Wolfle (1960) has recently pointed out "one of the basic ideals of a free society is the provision of opportunity for each person to develop to his full capacity." Yet numerous studies have shown that among high school graduates in the upper levels of ability, a common reason for failure to enter college is the financial problem. We cannot be satisfied with the discrepancy between the ideal of equality of educational opportunities for all citizens, rich or poor, and the fact that financial disabilities now prevent many of our talented students from realizing their potentialities.

To be sure our society has obligations to provide appropriate educational opportunities for those in lower, as well as higher, levels of ability. However, precisely because higher education requires such a long period of training and is so costly it is primarily the academically talented student who is most likely to find doors closed when seeking appropriate educational experience and training.

The need to replenish and increase the nation's supply of educated and trained persons capable of planning and directing our cultural, educational, scientific, and industrial enterprises provides an equally compelling reason for trying to find ways of reducing talent loss. No one has stated the case more persuasively than Whitehead (1929):

> In the conditions of modern life the rule is absolute, the race which does not value trained intelligence is doomed. Not all your heroism, not all your social charm, not all your wit, not all your victories...can move back the finger of fate. Today we maintain ourselves. Tomorrow science will have moved forward yet one more step, and there will be no appeal from the judgment which will then be pronounced on the uneducated.

It is not merely that we must find ways of educating more of our talented students if we are to maintain our position in the Age of Science--important though this goal is. In addition we must recognize that our survival depends upon our ability to develop the potentialities of young persons with exceptional promise. The emergence of Russia as a scientific power, armed with nuclear weapons and a highly developed missile technology, has many implications. Not only must we be prepared to recruit youth who will contribute to scientific breakthroughs, space technology, and an adequate system of military defense and retaliation, but equally important we must develop persons able to work with ideas and skilled in the art of reducing international tensions. In short, there are both idealistic and practical reasons which argue for a persistent attack upon the problem of talent loss.

The student's motivation to seek, and persist in, higher education is influenced by many persons and events at each stage of his development. Any comprehensive program of talent development must utilize a variety of incentives and persuasive strategies in attempting to find remedies for talent loss. Dael Wolfle (1960) writes:

> If one of us were suddenly assigned responsibility for developing a national policy of talent development, I wonder what he would do. No single one of us is likely to be given this responsibility, but collectively it is shared by many persons, whether they realize it or not. Every person who constructs or interprets a test or other measures for the selection of scholarship or fellowship winners, every college admissions officer, every guidance counselor, every education philosopher or administrator, and every teacher daily makes decisions that in fact do help to determine how the nation's intellectual resources are developed and utilized. Their actions constitute our unanalyzed, but nonetheless determining, present policy.

The variety of different "gate-keepers" controlling the nation's flow of educated talent, and the diversities in their professional commitments and operating philosophies, imply that implementation of any national policy of talent development must be a cooperative and interdisciplinary undertaking. Likewise, we must recognize that the activities of any single professional group--whether it be high school counselors, administrators of scholarship or loan funds, admissions officers, or college faculty members--can at best provide only a partial solution to the problem of talent loss.

The present study is primarily concerned with strategies for reducing talent loss which are applicable during the college years or during the 12th grade of secondary school. Limitation of the study to this period does not imply that significant losses of talent do not occur before the 12th grade, nor that counseling and learning experiences during the earlier years of high school are unimportant. On the contrary, it is known that many talented students do not finish high school. For example, Bridgman (1960) estimates that:

> ...for the ability range as determined by tests characterizing the top 30 per cent of high school graduates, about 45 per cent of the boys and 30 per cent of the girls in each entire age cohort, or age group, now graduate from college. Of the 55 per cent of the boys dropping out earlier, about one-fifth did not finish high school, two-fifths more did not enter college, and the remaining two-fifths did not finish college. Of the 70 per cent of the girls dropping out earlier, about one-seventh did not finish high school, four-sevenths more did not enter college, and the remaining two-sevenths did not finish college.

It should be noted that in eliminating from consideration some of the gate-keepers who presumably affect educational motivation we are at the same time limiting the number of students who can be salvaged. Consequently, the proper benchmark for evaluating the possible contribution of recruiting strategies applicable from the 12th grade on is not how much we can reduce talent loss among students in upper ability levels in the entire age cohort or even in the high school graduating class. It is rather how much we can reduce loss among the talented who have not already made decisions or commitments which preclude entering college. Even with unlimited scholarship resources we could not expect to salvage all high-ability students who graduate from high school. Many will have made decisions early in the high school years (e.g., to enter trade or industrial training courses, to become secretaries, to get married after graduation, etc.) which are not easily reversed by events coming at the end of high school or during college. In general the strategies considered here can only be expected to influence those students who are "potential" college entrants.

The population of "potential" college entrants includes high school graduates qualified for higher education and not committed to other pursuits. There are several possible methods for studying this population. One approach is to select a representative sample of secondary schools throughout the nation to administer college aptitude tests to 12th grade students in these schools, and to obtain an expression of interest in higher education--preferably under "ideal" conditions (e.g., assuming all college costs were provided by a scholarship). The study conducted by the Educational Testing Service (Stice et al., 1956; Educational Testing Service, 1957) illustrates this approach. Another approach is to use aptitude test scores obtained in state-wide or national testing programs for identifying those qualified for college, and to isolate for study samples of high-ability students who might be recruited for higher education. Although several talent loss studies have utilized state-wide testing data (Corcoran and Keller, 1957; Little, 1958, 1959; Stroup and Andrew , 1959) none of these have attempted to isolate those high-ability students who might be susceptible to incentives designed to encourage college attendance.

Of course any existing method for identifying qualified high school students who might be recruited into higher education is subject to error. Responses to hypothetical questions such as "Would you go to college if you were completely free to make your own choice?" may be misleading because of the respondent's desire to make a favorable impression. Similarly, even if we utilize some overt behavior on the student's part, such as submitting to college aptitude or scholarship qualifying tests, as an indicant of interest in college there will be some errors of classification. Presumably some students take college aptitude examinations merely to see how they stand relative to others, to satisfy the demands of teachers and counselors, etc. However even motivational "tests" of moderate validity will help to screen out those who make commitments early in high school which are more or less irreversible. Chapter 2 describes the methods used in the present study to obtain a sample of potential college entrants.

In considering the information needed to evaluate different strategies which might be employed to better conserve and utilize the nation's supply of intellectual talent, we have organized our inquiry around three inter-related problems:

First, what are the dimensions of talent loss during the transition from high school to college? How many students who are potential applicants for college and who rank in the upper third of the distribution of scholastic ability continue their schooling beyond high school?

What are the characteristics of students who do not continue? How does talent loss vary by state, geographical region, sex, and aptitude level? These questions, and others, are considered in Chapter 3 and 4.

Second, how effective are the major strategies currently being used to reduce talent loss between high school and college? Do programs desinged to provide recognition of excellence motivate students to seek advanced training? Are offers of scholarships effective in recruiting students into college? How are the nation's resources for encouraging college attendance distributed. How do colleges and fields of study differ in their ability to recruit potentially talented students? What are the implications for developing a national policy of talent development? We shall consider these and related questions in Chapters 5-10.

Third, how are the student's experiences during the initial college years related to his persistence in college and his plans to seek advanced training? What kinds of instructional goals, teaching practices, and student peer group characteristics encourage talented students to realize their potentialities? Chapters 11-13 describe studies which attempt to answer these questions.

Chapter 2

THE SAMPLE

The purposes of this chapter are to describe methods used in selecting the study sample, to assess possible sources of bias, and to consider the extent to which the sample may be considered to be representative of the population of potential college entrants.

The Target Population

Our aim was to sample a population of students qualified for college and at the same time susceptible to being recruited into higher education. Participation in the 1958 National Merit Scholarship Qualifying Test (NMSQT) was taken as an indication of interest in college (and therefore of susceptibility to recruitment into college). Graduation from high school and test performance at a level equal to or higher than the 64th percentile relative to national norms were taken as criteria of qualification for college.

Test records were available for 478,873 students who had participated in the 1958 NMSQT in schools located in one of the 50 states or in the District of Columbia. Most, but not all, of these students were second-semester juniors or first-semester seniors at the time they took the examination. It is estimated that 98.4%, or about 471,400, of the examinees had class standings such that they would have graduated in normal progression during the school year 1958-59.[1] Of course not all these students had test scores sufficiently high to be included by our test performance criterion. Only 63% of the eligible test-takers, or 299,529 students had test scores equivalent to the 64th percentile or higher. Table 1 shows that this population of approximately 300,000 students represented 42% of all juniors in the upper 36%, and 53% of all juniors in the upper 10% of the ability distribution of the grade-cohort group. In general, the proportion of 11th grade students participating in the examination increased as ability level increased. (The only notable exception to this trend was found among students ranking in the upper 4% of ability, who participated somewhat less frequently than peers with slightly lower ranks.)

In order to include in the sample only qualified examinees who had graduated from high school screening procedures were used both in the initial selection of the sample and in later phases of the study.

Initial selection of sample. Random samples were drawn from the NMSQT answer sheets of students in each state. The number of examinees selected in each state was proportionate to the number of public high school graduates during the school year, 1955-56 (Schloss and Hobson, 1959).

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[1] Estimated from the observed rate of ineligible examinees in the 1959 Merit testing program, since no count was made of the number of ineligible examinees in 1958. This estimate is slightly higher than the estimate of 450,848 graduates shown in Table A-4 in Appendix A. The latter is based upon data from principals of participating secondary schools who were asked to report the number of their 1959 graduates who had taken the Merit test. The discrepancy is presumably due to the fact that reports were received from only 12,781, or 88.4%, of the 14,465 participating schools.

Table 1

Estimated Percentages of 11th Grade Students at Given Aptitude Levels Taking 1958 NMSQT

Aptitude Level				
NMSQT selection score	Equivalent percentile rank relative to 11th grade national norms	Estimated No. of all mid-semester juniors at given aptitude level in Spring, 1958*	Estimated No. of eligible test-takers in Spring, 1958 at given aptitude levels‡	Estimated per cent ages of 11th grade students at given aptitude levels taking test
88 - 92	64 - 68	115,195	39,169	34.0
93 - 97	70 - 74	103,480	40,770	39.4
98 - 102	75 - 79	101,527	39,622	39.0
103 - 107	80 - 84	97,623	37,662	38.6
108 - 112	85 - 89	87,860	34,007	38.7
113 - 117	90 - 92	58,574	29,456	50.3
118 - 122	93 - 94	37,097	23,817	64.2
123 - 127	94 - 96	29,287	18,568	63.4
128 +	96 +	80,050	36,458	45.5
Totals		710,693	299,529	42.1

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* Eleventh-grade enrollment in public and nonpublic shcools was estimated to be 1,952,453. This figure, which is for 50 states and D.C., is based upon an 11th grade enrollment of 1,743,648 in public schools during the school year 1957-58 and a ratio of .893 between public school enrollment and total enrollment.

‡ Ineligible test-takers (i.e., students not expected to graduate from high school in 1959) at each aptitude level were estimated from participants in the 1959 NMSQT.

Only students with test scores of 88 or higher and who indicated that they expected to graduate from high school in 1959 were eligible for inclusion.

The initial sample included 30,314, or approximately 10%, of the eligible examinees meeting the test performance criterion. Although the percentage of eligible and qualified examinees selected in each state varied because of the quota limits used, it makes little difference in estimating talent loss--as we shall see in Chapter 3--whether adjustments are made for oversampling or undersampling examinees in different states. Table 2 shows for each state the sample sizes, sampling ratios, and the estimated number of all qualified and eligible examinees. It can be seen that there was considerable variation between geographical regions and states in the proportion of qualified and eligible examinees included in the sample. Thus 18 per cent of the examinees in the Southeast region were included, while only seven per cent of the examinees in the North Atlantic region were included. By state there was even greater variation. In Alabama and Mississippi 25 per cent of the examinees were included, while in Alaska only five per cent of the examinees were included. Fortunately these sampling ratios tend to offset geographical biases arising from unequal rates of participation in the Merit test. In Table A-4 of Appendix A it can be seen that only about 20 per cent of the high school graduates in the Southeast region, as compared with 33 per cent of the graduates in the North Atlantic region, took the Merit test. Similarly, 15 per cent of the graduates in Alabama and Mississippi, as compared with 43 per cent of the graduates in Alaska, took the test.

Table 2

Geographical Distribution of the Initial Sample of Qualified and Eligible Examinees

State and geographical region	Estimated number of qualified and eligible examinees (1)	Number of students selected in each state (2)	Sampling ratio (ratio of col. 2 to col. 1) (3)
North Atlantic	98,896	7,398	.07
Connecticut	5,118	363	.07
Delaware	792	63	.08
Maine	1,642	163	.10
Maryland	4,343	404	.09
Massachusetts	11,423	847	.07
New Hampshire	1,421	93	.07
New Jersey	11,720	853	.07
New York	36,398	2,330	.06
Pennsylvania	22,351	2,036	.09
Rhode Island	1,533	105	.07
Vermont	882	68	.08
D. C.	1,273	73	.06
North Central	102,945	9,486	.09
Illinois	21,287	1,553	.07
Indiana	9,031	940	.10
Iowa	7,120	645	.09
Kansas	4,180	480	.11
Michigan	15,670	1,333	.09
Minnesota	7,288	751	.10
Missouri	6,649	709	.11
Nebraska	3,378	318	.09
North Dakota	1,154	152	.13
Ohio	16,778	1,628	.10
South Dakota	1,325	162	.12
Wisconsin	9,085	815	.09
Southeast	37,629	6,667	.18
Alabama	2,495	629	.25
Arkansas	1,829	401	.22
Florida	5,672	594	.10
Georgia	3,615	610	.17
Kentucky	2,702	483	.18
Louisiana	2,775	514	.19
Mississippi	1,552	383	.25
North Carolina	4,116	920	.22
South Carolina	2,492	409	.16
Tennessee	3,860	635	.16

Table 2 (Cont'd)

State and geographical region	(1)	(2)	(3)
Southeast (Cont'd)			
Virginia	4,283	625	.15
West Virginia	2,238	464	.21
West and Southwest	58,772	6,621	.11
Arizona	1,835	171	.09
California	22,140	2,331	.11
Colorado	3,240	297	.09
Idaho	1,548	166	.11
Montana	1,531	141	.09
Nevada	454	43	.09
New Mexico	1,116	150	.13
Oklahoma	3,484	565	.16
Oregon	3,831	368	.10
Texas	10,930	1,550	.14
Utah	1,731	218	.13
Washington	6,245	545	.09
Wyoming	687	76	.11
Outlying Parts	1,444	142	.10
Alaska	292	16	.05
Hawaii	1,152	126	.11
Continental U. S.	298,242	30,172	.10
Total - 50 states plus D.C. *	299,686	30,314	.10

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* The slight discrepancy in the estimated number of qualified and eligible examinees shown in Tables 1 and 2 (299,529 vs. 299,686) arises from rounding errors in applying rates of ineligible examinees by apptitude level and by state.

The sampling design represented a compromise between the desire to sample the population of eligible and qualified Merit examinees and the desire to sample the nation's population of high ability youth. In general, use of the state quotas described resulted in oversampling students from states and geographical regions in which the rate of participation in the Merit program is lowest. Thus the correlation between the sampling ratios given in Table 2 and the estimated percentage of the state's high school graduates taking the test was -.86. Similarly, the correlation between the sampling ratios and the estimated percentage of each state's graduates from public secondary schools who attended schools offering the test was -.84. Of course it is possible to obtain unbiased estimates for the population of eligible and qualified examinees by weighting each state subsample in proportion to the relative number of such examinees in that state. Such adjustments were made for estimates of talent loss, but resulted in only negligible differences from the estimates obtained by "self-weighting" averages. Consequently such adjustments were ignored in later analyses.

Surveys of Students and High School Principals. A self-administered mail questionnaire was sent to the home address of each selected student in mid-September, 1959, when these students would normally enter college. The questionnaire, which could be answered appropriately by both college-attenders and by students who discontinued school, requested information about a variety of student characteristics and experiences. Many of the items were borrowed from questionnaires used in previous studies of talent loss (Berdie, 1954; Educational Testing Service, 1957; Little, 1958; Stroup and Andrew , 1959; Thistlethwaite, 1958). The questionnaire, which is included in Appendix G , requested information about exposure to financial aid offers and grants, vocational and educational aspirations, enrollment in college and other types of schools, cultural atmosphere of the home, encouragement received from parents and high school counselors, reasons for college choice or for discontinuing school, and other personal characteristics. Two follow-up mailings were sent to non-respondents, one in November, 1959 and one in February, 1960.

A brief questionnaire was also sent to the principal of each secondary school offering the Merit test. The purpose of this mailing was two-fold: to obtain ranks in high school graduating class for each student in the sample, and to obtain information about 1959 graduates useful in assessing the coverage of the Merit test. Some participating schools did not have any students included in the selected sample, while other schools did. Since high school ranks were requested only from the latter, slightly different forms of the letter sent to principals were used for the two groups of schools. One follow-up mailing was sent to non-responding principals in January, 1960.

Screening of Sample on the Basis of Survey Returns. Questionnaire returns from the students and from principals of secondary schools offering the Merit test resulted in the identification of a small number of deceased students and of additional non-graduates, who were eliminated from the sample. In addition, approximately one per cent of the students had moved and left no forwarding address. Since these students were ineligible or had no opportunity to respond to the questionnaire they have been treated in the remaining tables as if they were not a part of the designated sample. Tables 3 and 4 summarize returns from the surveys. It can be seen that useable returns were received from 26,771 students or 90.1% of the designated sample. Although some high school principals failed to provide the information requested, returns were reasonably complete so that a relatively accurate estimate could be made of the proportion of 1959 graduates exposed to the testing program.

NMSQT Participation as a Sign of Educational Motivation. Analyses summarized in Table 5 demonstrate that over 85% of all 1959 graduates attended schools in which the Merit test was offered, yet only about 27% of all 1959 graduates participated in the test. Obviously a large number of students did not take advantage of the opportunity to participate in the test. Presumably guidance counselors and principals (who had the authority to deny permission to take the test) discouraged some students with poor scholastic achievement from participating. We have already seen in Table 1 that participation tended to be higher among students who were more qualified for college. However, individual student decisions were probably the major determinant of participation. The kind of self-selection occurring under these conditions can be inferred from a study reported by Dirks and Anderson (1960). These investigators compared participants and non-participants in the 1958 Merit test given in secondary schools in Kansas. Although the authors do not describe the procecures used to obtain random sample of non-participants, they state that "a random group of five...(non-participants) from each school" was asked

Table 3

Returns from Survey of Merit Examinees at the Beginning of College

Response status as of March 31, 1960	Number of students	Percentage of initial sample	Percentage of initial sample not including deceased and non-graduates (N=30,057)	Percentage of designated sample (N=29,720)
Respondents (useable returns)	26,771	88.3	89.1	90.1
Non-respondents	2,949	9.7	9.8	9.9
Untraceable (left no forwarding address)	337	1.1	1.1	
Deceased	19	.1		
Did not graduate from high school in 1959	238	.8		
TOTALS	30,314	100.0	100.0	100.0

Table 4

Returns from Survey of High Schools Participating
in the 1958 NMSQT

		Number and percentage responding			
		Schools providing estimates of number of 1959 graduates		Schools providing estimates of number of 1959 graduates taking 1958 NMSQT	
Type of control of secondary schools	Number of participating schools*	Number of schools	Percentage	Number of schools	Percentage
Public	11,742	10,473	89.2	10,317	87.9
Catholic	1,852	1,704	92.0	1,671	90.2
Other, private	871	806	92.5	793	91.0
TOTALS	14,465	12,983	89.8	12,781	88.4

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* Includes only schools located in the Continental U. S. or in Alaska or Hawaii.

Table 5

Estimated Number and Percentage of 1959 Secondary School Graduates Examined or Attending Schools Offering the NMSQT by Geographical Region

		Screened population		Tested population	
Geographical region	Estimated No. of 1959 graduates from all U. S. secondary schools (1)	No. of 1959 graduates attending schools participating in 1958 NMSQT (2)	Percentage of 1959 graduates attending participating schools (3)	No. of 1959 graduates tested in Spring, 1958 (4)	Percentage of 1959 graduates tested in Spring, 1958 (5)
North Atlantic	436,477	412,784	94.6	142,300	32.6
North Central	512,568	453,921	88.6	153,046	29.9
Southeast	329,693	227,127	68.9	65,991	20.0
West and Southwest	355,242	302,898	85.3	87,080	24.5
Alaska and Hawaii	7,742	7,706	99.3	2,431	31.3
Continental U. S.	1,633,980*	1,396,730	85.5	448,417	27.4
Total - 50 States plus D. C.	1,641,722	1,404,436	85.5	450,848	27.5

* The U.S. Office of Education reports 1,639,000 as the projected number of 1959 high school graduates for the Continental U.S. Using this figure as the base, at least 85.0 per cent of 1959 graduates attended participating high schools, and at least 27.4 per cent were tested.

to complete the same questionnaire completed by students who had taken the Merit test. Their results, which are summarized in Table 6, indicate that students who did not take the test, even though their schools offered it, less frequently planned to attend college and less frequently had parents who wanted them to attend. In addition, non-participants spent less time in homework study and typically had taken fewer courses in mathematics, foreign languages, English, and science. The differences between groups and the relatively high level of motivation indicated by participants are consonant with the assumption that test participation may be construed as a sign of interest in college.

Selection Bias

It seems likely that the 300,000 Merit examinees selected for study differ in a number of respects from the entire population of potential college entrants. First, as Table 1 shows, participation in the Merit test generally increased with aptitude level but paradoxically decreased at the highest ability levels. The tendency for aptitude and motivation for college to be positively correlated would explain why higher ability students participated in the test more frequently but it would not explain why students ranking in the top 4 per cent of ability participated less frequently than their peers with slightly lower aptitudes. Possibly students ranking at the highest ability levels were drawn from well-to-do families with less need for scholarship assistance, or these students thought they had good chances of obtaining scholarships from other sources and saw little advantage in competing for Merit

Table 6

Differences Between Participants and Non-participants in the National Merit Scholarship Testing Program

(Data from Dirks and Anderson, 1960)

Attribute	Percentage of students having indicated attribute* Participants (N=4,674)	Non-Participants (N=1,024)	Percentage diff.	rtet‡
Educational motivation				
1. Planned to continue schooling after graduation	82	54	28	.44
2. Planned to attend college	76‡	52‡	24	.37
3. Spent 10 or more hours per week in homework study	40	23	17	.26
Encouragement to attend college				
4. Parents wanted student to attend	88	72	16	.33
5. Teachers encouraged student to attend	67	55	12	.17
Educational level of parents				
6. Father graduated from high school	65	48	17	.24
7. Mother graduated from high school	75	62	13	.20
Ability to pay college costs				
8. Family could pay $500 or more for Freshman year	66	56	10	.14
9. Student believes family could afford to help	84	76	8	.16
High school preparation				
10. Took 3 or more semesters of mathematics	88	70	18	.36
11. Took 1 or more semesters of foreign languages	52	32	20	.28
12. Took 7 or more semesters of English	66	46	20	.27
13. Took 5 or more semesters of science	42	28	14	.21

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* The N's shown are those for the item answered most frequently by respondents. N's on which percentages are based vary somewhat due to non-response to individual questionnaire items.

‡ Estimated by writer.

scholarships. Second, as Table 5 shows, students in the South had less opportunity to take the Merit test, since a smaller proportion of the secondary schools in the South participated in the program. Only 69% of the 1959 graduates from schools in the Southeast while 95% of the graduates from schools in the North Atlantic region, attended schools offering the Merit test. While we can infer that non-participating schools were typically ones of small enrollments located in rural areas of the country, it cannot be assumed that no potential college entrants would be found in these schools. Consequently the failure to adequately sample students at these schools must result in some selection bias.[2]

On the other hand, the sampling ratios described in Table 2 show that examinees from the South have been oversampled relative to examinees in other regions. Consequently use of the state quotas previously described tends to compensate to some degree for the selection bias arising from poorer school coverage in the South. The fact that selection biases were partly nullified by oversampling students in the South thus provided additional justification for not adjusting sample estimates according to the sampling ratio of examinees in each state. Similarly, as we shall see in the next section, the response rate for students ranking at the highest level of ability was greater than for any other group of students, so that again the analyzed sample seemed to contain biases which partially compensated for the selection biases characterizing high-ability Merit examinees.

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[2] A more detailed analysis of school coverage, and of the proportions of high school graduates in each state attending participating schools and taking the Merit test, is presented in Appendix A.

Response Bias

Of the 29,720 examinees who could have responded to the student survey (the Designated Sample) 26,771 returned completed questionnaires (the Analyzed Sample). To assess possible response bias the two samples are compared with respect to geographical region of high school, sex, and aptitude level in Tables 7 and 8.

Bias Associated with Geographical Region. Students in the North Atlantic region gave the highest rate of returns (91.0%) while those in the South gave the lowest (87.8%). Although the difference in rate of returns from these two regions is statistically significant, the absolute difference is quite small. When we exclude the South none of the remaining percentages differ reliably. Greater variation was found in returns from examinees classified by state. Thus, Maryland and Utah students responded most frequently ([illegible] and [illegible]%, respectively), while Alaska and South Carolina students responded least frequently (80.0 and 82.3%, respectively).

Sex Bias. Women responded slightly more often than men (90.3 vs. 89.8% respectively), but the difference was not statistically significant and it is clear that there was no sex bias in the returns.

Bias Associated with Aptitude Level. Table 8 shows that the percentage of students responding tends to increase fairly regularly with aptitude level, both among men and women. Students with NMSQT scores of 125 or greater, responded most frequently (94.9% returns) while students

Table 7

Response Bias Associated with Geographical Region

Geographical region	Number in designated sample	Number in analyzed sample	Analyzed sample as a percentage of designated sample
North Atlantic	7,277	6,623	91.0
North Central	9,332	8,472	90.8
Southeast	6,521	5,726	87.8
West and Southwest	6,457	5,830	90.3
Alaska and Hawaii	133	120	90.2
TOTALS	29,720	26,771	90.1

Table 8

Response Bias Associated with Sex and Aptitude Level

Aptitude Level		Number and percentage of students*								
		MEN			WOMEN			TOTAL		
NMSQT selection score	Equivalent percentile rank relative to national norms	D.S.	A.S.	A.S. as a % of D.S.	D.S.	A.S.	A.S. as a % of D.S.	D.S.	A.S.	A.S. as a % of D.S.
88-89	64-65	785	655	83.4	782	657	84.0	1567	1312	83.7
90-92	66-69	1183	1017	86.0	1192	1038	87.1	2375	2055	86.5
93-97	70-74	2023	1790	88.5	2108	1861	88.3	4131	3651	88.4
98-102	75-79	1901	1660	87.3	2072	1824	88.0	3973	3484	87.7
103-107	80-84	1842	1647	89.4	1949	1758	90.2	3791	3405	89.8
108-113	85-89	2063	1846	89.5	1972	1806	91.6	4035	3652	90.5
114-124	90-94	2802	2568	91.6	2557	2386	93.3	5359	4954	92.4
125 or more	95 +	2638	2507	95.0	1851	1751	94.6	4489	4258	94.9
TOTALS		15,237	13,690	89.8	14,483	13,081	90.3	29,720	26,771	90.1

* D.S. = Designated Sample, A.S. = Analyzed Sample.

with NMSQT scores of 88 or 89 responded least frequently (83.7% returns). The analyzed sample is thus most representative of high-ability examinees, and least representative of students who barely qualify for college.

Over-all Characteristics of the Sample

Our objective was to sample a hypothetical population consisting of graduates of secondary schools who are qualified for college and who had not made decisions or commitments which precluded entering college. The steps taken to obtain a sample of students having the desired characteristics amounted to a sequential filtering of examinees. The main stages in this filtering are summarized in Figure 1. Group A included all students taking the 1958 Merit test; B, only those expected to graduate during the school year 1958-59; C, only the eligible examinees having test scores of 88 or greater (equivalent to a percentile rank of 64 relative to national norms); D, only the qualified and eligible examinees selected in the random sample; E, only those in the initial sample known to have graduated from high school and not deceased or untraceable; and F, only those in the designated sample responding to the initial survey questionnaire.

The evidence bearing upon the representativeness of the analyzed sample may be summarized as follows:

First, it was assumed that participation in the Merit test is a sign that the student is considering college. Comparisons of the educational plans and high school courses of participants and of non-participants in the Merit test generally support this assumption.

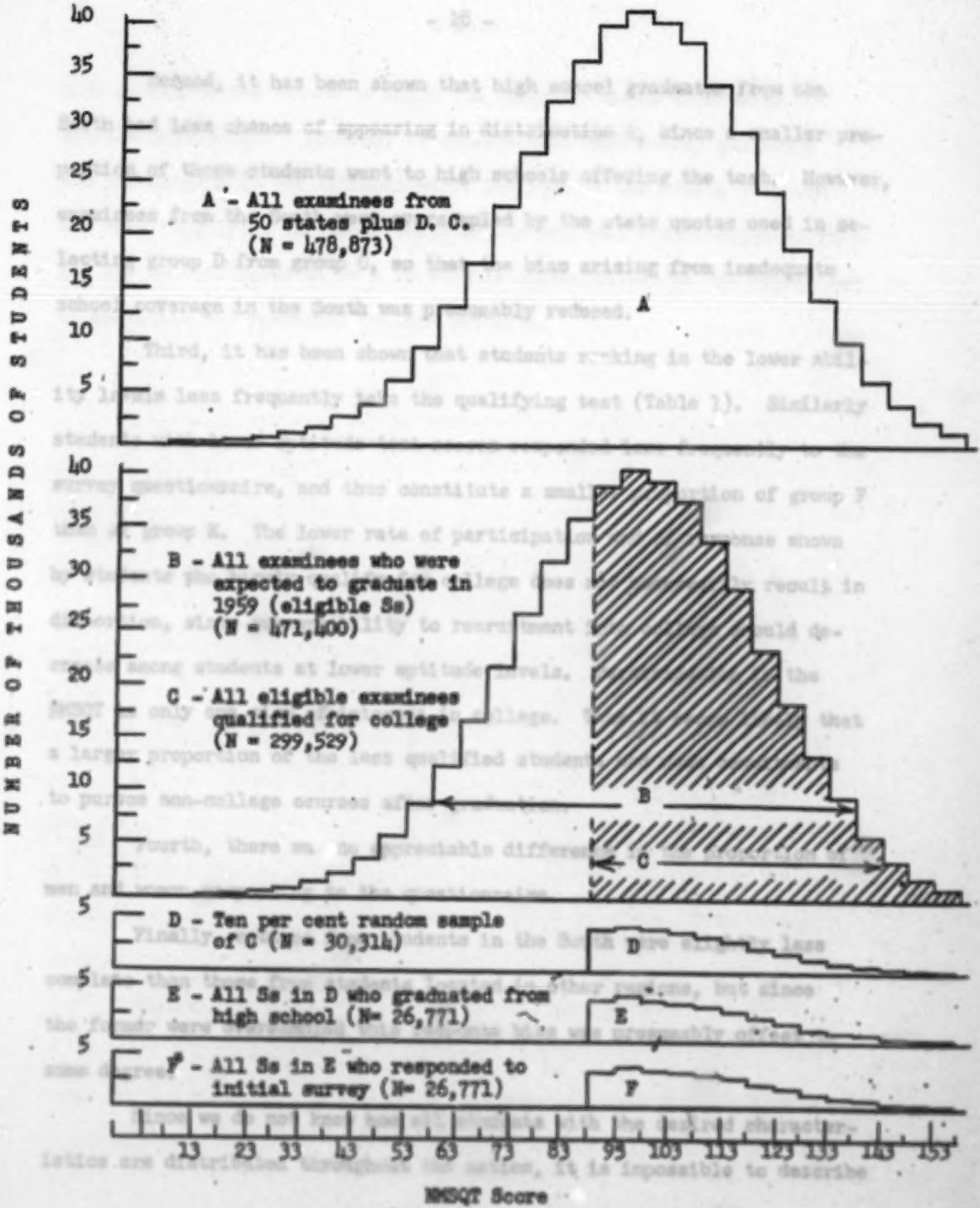

Figure 1 Successive Stages in Selection of Sample from Examinees in the 1958 Merit Program

Second, it has been shown that high school graduates from the South had less chance of appearing in distribution A, since a smaller proportion of these students went to high schools offering the test. However, examinees from the South were oversampled by the state quotas used in selecting group D from group C, so that the bias arising from inadequate school coverage in the South was presumably reduced.

Third, it has been shown that students ranking in the lower ability levels less frequently take the qualifying test (Table 1). Similarly students with lower aptitude test scores responded less frequently to the survey questionnaire, and thus constitute a smaller proportion of group F than of group E. The lower rate of participation and of response shown by students who barely qualify for college does not necessarily result in distortion, since susceptibility to recruitment into college should decrease among students at lower aptitude levels. Participation in the NMSQT is only one sign of interest in college. Thus it seems likely that a larger proportion of the less qualified students had made commitments to pursue non-college courses after graduation.

Fourth, there was no appreciable difference in the proportion of men and women responding to the questionnaire.

Finally, returns from students in the South were slightly less complete than those from students located in other regions, but since the former were oversampled this response bias was presumably offset to some degree.

Since we do not know how all students with the desired characteristics are distributed throughout the nation, it is impossible to describe with precision the extent to which the analyzed sample represents the desired population. However, it appears that high school graduates who participate in the National Merit Scholarship Qualifying Test and who rank roughly in the upper third of the national distribution of ability may be considered to be a reasonable approximation to the population of qualified and potential college entrants.

Chapter 3

TALENT LOSS BETWEEN HIGH SCHOOL AND COLLEGE

The Merit program may be considered a model for a larger, nationwide program of talent development. Although an enlarged national talent search would undoubtedly identify more potential college students, its testing procedures would be similar to those of the Merit program, and it would identify students having characteristics similar to those of examinees described above. Thus information about the post-graduation activities of Merit examinees should be of value in estimating the need for an enlarged talent search and in sketching its shape.

In this chapter we consider differences in college recruitment between socio-economic, geographical, ability, and sex groups. There are great differences in talent loss among these groups, and future efforts to salvage intellectual talent would have greater pay-off if we were to use new resources to influence groups in which the loss is greatest. Chapter 4 presents a more detailed analysis of the plans, attitudes, and background traits of students who have discontinued school, and discusses prospects for recruiting greater numbers of these students into college.

Customarily "talent loss" has been estimated by the proportion of all high school graduates in the upper levels of ability who do not enter college as full-time students. However, Bridgman (1960) has recently questioned whether all potential college entrants should be encouraged to attend college. He writes:

> How truly democratic is a public attitude which fails to acknowledge that occupations for which less formal education is needed are more satisfying to the interests of many individuals, more likely to lead to successful careers for them, and equally necessary for society as compared to professional or white collar pursuits? At what minimum level of mental capacity, academic interest, drive, and constructive purpose, is it better for today's youth of 18 to take a full-time job rather than continue in school or college?

As we shall see, many of our potential college entrants report that they have enrolled in college only part-time, have entered business, trade, or nursing courses not leading to a Bachelor's degree, or have temporarily postponed enrolling in college. To be sure, many of these students are pursuing careers in which they will find satisfaction. Nonetheless, most of these students have demonstrated an interest in attending college, and presumably would have profited from immediate and full-time entry into higher education. From the nation's standpoint they represent "talent loss." No violation of individual freedom is involved in making higher education available to more of our talented youth. Indeed it may be argued that there is true freedom of vocational choice only when all avenues to appropriate educational experiences are open. One may grant the desirability of providing equality of educational opportunity to all students, and yet question whether all potential college entrants should be recruited into higher education. Much will depend upon the proposed methods of recruitment, the supply of educated talent relative to national demands, and the quality of the educational experiences provided in our universities and colleges. To raise such questions is to suggest that interpretations of the implications of the findings will vary according to other facts, some of which are considered in later chapters. For the present, the term "talent loss" will be used only in the non-evaluative sense indicated at the beginning of this paragraph, except that we have restricted the reference population to qualified graduates who have demonstrated an interest in college.

Previous talent loss studies have not distinguished between students who disqualify themselves from college and those who do not. Consequently these studies tend to over-estimate the number of students who might be salvaged by an enlarged college recruitment program. It is unlikely that scholarship offers or other incentives provided at the end of the senior year of high school will reverse the effects of early decisions not to enter college. Unfortunately such decisions tend to be irreversible--as, for example, when the student decides to enroll in a curriculum which does not prepare him for college or decides to get married. Similarly, scholarship offers would be expected to have little influence upon students with long-standing "motivational deficits", which predispose the student to discontinue school at the earliest opportunity (Hollingshead, 1952; Stivers, 1958). For these reasons, we have attempted to study talent loss among potential college entrants, hoping thereby to obtain more realistic estimates of the number of additional students who might be recruited into college.

Talent Loss Among Potential College Entrants

Table 9 provides information about the immediate retention of

Table 9

Percentages of Qualified and Potential College Entrants Enrolling in College Immediately after High School Graduation

		Percentage with given status in Fall, 1959				
					Discontinued schooling, with	
Aptitude level	No. of students	Enrolled in college full-time	Enrolled in college part-time	Enrolled in other kinds of training courses	plans to enroll in college in a year or two	no plans to enroll in college
All Ss with NMSQT scores of 88 or greater:						
Men and women	26,771	81.3	1.9	6.2	4.7	5.9
Men	13,690	86.3	1.8	2.6	5.3	3.9
Women	13,081	76.1	2.0	9.9	4.1	7.9
Ss ranking in upper 30 per cent:						
Men and women	23,404	83.0	1.8	5.6	4.3	5.3
Men	12,018	87.7	1.7	2.4	4.8	3.4
Women	11,386	78.0	2.0	8.9	3.7	7.4
Ss ranking in upper 10 per cent:						
Men and women	9,212	89.8	1.1	3.6	2.5	3.0
Men	5,075	93.0	1.1	1.4	2.8	1.7
Women	4,137	85.9	1.2	6.1	2.2	4.6

Merit examinees whose NMSQT scores placed them in the upper 36, 30, or 10% of ability relative to national norms for second-semester juniors. The following are points of special interest in this table. First, examinees who did not immediately enroll in college as full-time students are a heterogeneous group--some enter business, nursing, religious, or other non-college training courses; some enroll in evening school or extension courses; even among those discontinuing school a sizeable number say they plan to enroll in college in a year or two. Second, at each of the ability levels shown, women entered college less frequently than men. Lastly, almost 90% of the students ranking in the upper 10% of ability, and 83% of those ranking in the upper 30% of ability entered college. Both of these retention rates are unusually high when compared with previous estimates.

Table 10 compares estimates of retention among Merit examinees with those for less highly selected students from various state and national studies. It may be seen that the percentage of selected Merit examinees enrolling in college far exceeded all previous estimates of the percentage of high school graduates entering college. Thus 83% of all selected examinees ranking in the upper 30% of ability, while only an estimated 53-58% of all high school graduates at a comparable ability level, went to college. Similarly, among students in the upper 10% of ability, the 90% retention for Merit examinees is well above the 68-73% retention for high school graduates.

To interpret these differences we must consider some of the unique

Table 10

State and National Studies on Percentages of High School Graduates who Enter College Immediately

	Percentage of immediate college entrants to high school graduates						Percentage of potential college entrants enrolling in college immediately (class of 1959)[7]
	State Estimates				National Estimates		
	Kansas (class of 1955)[1]	New York (class of 1956)[2]	Arkansas (class of 1957)[3]	Wisconsin (class of 1957)[4]	ETS - NSF (class of 1955)[5]	Bridgman (class of 1957)[6]	
All high school graduates:							
Men and women	40	43	26	30	31	37	
Men	46	50	30	34	36	41	
Women	34	36	22	26	27	32	
Upper 30 per cent:							
Men and Women	65	64	56	54	53	58	83
Men	74	69	60	60	60	65	88
Women	54	59	50	44	46	50	78
Upper 10 per cent:							
Men and Women		75		66	68	73	90
Men		80		72	75	80	93
Women		81		59	60	65	86

Footnotes for Table 10

[1] Daughtry (1956), p. 19,51.

[2] Reported by Bridgman (1960), p. 38. Figures given are only for upstate New York.

[3] Stroup and Andrew (1959), p. 39,51. Figures given for upper 30% are based on students ranking in upper 34% of test distribution.

[4] Little (1960), p. 11,14. Percentages represent plans of seniors.

[5] Educational Testing Service (1957), Table D-3, Appendix D.

[6] Bridgman (1960), p. 38. The present table is modeled after one given by Bridgman. However, several corrections and additions have been made (e.g., in Bridgman's Table 5 figures for the upper 10 and 30% were transposed, but the Arkansas figures are for the upper 30%).

[7] From Table 9.

characteristics of the sample of Merit examinees noted above. First, the use of faulty state quotas, which resulted in oversampling examinees in southern states while undersampling those in other states, had only a negligible effect upon the national estimates. These estimates were computed by two methods: (a) an estimate of retention or loss (P) was derived by weighting percentages in each state in proportion to the size of the analyzed sample in each state, and (b) an estimate (P') was derived by weighting percentages in each state in proportion to the total number of eligible examinees in each state meeting the test score criterion. The latter yielded estimates for the total population of qualified examinees unaffected by variations in sampling ratios. Almost identical results were obtained by the two methods of estimation (Table 11) and it is concluded that the explanation for the unusually high retention rate of Merit examinees lies elsewhere.

Second, the high retention rate could reflect an oversampling of high-ability examinees, since students with high test scores returned questionnaires more frequently than students with test scores very close to the cut-off score. College-going behavior is positively correlated with aptitude test scores, and such a response bias would tend to inflate retention rates for the analyzed sample. On the other hand, it will be recalled that the Merit examinees were tested during the second-semester of the eleventh grade, and in using these scores as indicants of ability relative to high school graduates "regression effects" must be considered. Because of errors of measurement we would not expect all juniors in the upper 30% of a test distribution to rank in the upper 30%

Table 11

Percentages of Men and Women Enrolling in College Immediately and Discontinuing School by State and Geographical Region

State and Region	Men			Women			Total		
		Percentages			Percentages			Percentages	
	N (1)	Enrolled in college full-time (2)	Discontinuing school (3)	N (4)	Enrolled in college full-time (5)	Discontinuing school (6)	N (7)	Enrolled in college full-time (8)	Discontinuing school (9)
North Atlantic	3,527	85.5	9.0	3,096	75.1	8.8	6,623	80.6	8.9
Connecticut	188	89.9	4.3	138	88.4	3.6	326	89.3	4.0
Delaware	31	93.5	3.2	26	73.1	3.8	57	84.2	3.5
Maine	86	75.6	12.8	60	75.0	15.0	146	75.3	13.7
Maryland	198	85.9	8.1	173	83.8	4.0	371	84.9	6.2
Massachusetts	361	86.1	8.6	396	74.2	6.8	757	79.9	7.7
New Hampshire	53	71.7	22.6	30	66.7	16.7	83	69.9	20.5
New Jersey	394	87.8	7.4	352	76.4	8.5	746	82.4	7.9
New York	1,136	88.5	6.9	966	79.0	7.8	2,102	84.1	7.3
Pennsylvania	962	81.1	12.8	857	67.3	12.4	1,819	74.6	12.6
Rhode Island	46	87.0	6.5	47	74.5	8.5	93	80.6	7.5
Vermont	28	78.6	17.9	29	51.7	6.9	57	64.9	12.3
D. C.	44	90.9	2.3	22	95.5	---	66	92.4	1.5
North Central	4,240	85.4	10.0	4,232	71.0	15.5	8,472	78.2	12.7
Illinois	722	90.0	6.9	669	73.8	13.0	1,391	82.2	9.9
Indiana	416	78.4	13.2	417	65.9	17.5	833	72.1	15.4
Iowa	277	80.9	14.4	275	65.1	18.5	552	73.0	16.5
Kansas	215	88.4	9.8	202	73.8	16.8	417	81.3	13.2
Michigan	625	87.5	9.0	570	69.1	16.8	1,195	78.7	12.7
Minnesota	326	87.7	8.3	361	69.3	15.2	687	78.0	12.0
Missouri	282	85.1	11.3	326	75.2	13.5	608	79.8	12.5
Nebraska	130	83.8	12.3	159	66.0	19.5	289	74.0	16.3

Table 11 (Con'd)

State and region	Men N (1)	Men full-time (2)	Men discon-timing (3)	Women N (4)	Women full-time (5)	Women discon-timing (6)	Total N (7)	Total full-time (8)	Total discon-timing (9)
North Dakota	63	85.7	7.9	71	77.5	14.1	134	81.3	11.2
Ohio	758	84.8	9.4	724	73.6	13.0	1,482	79.3	11.1
South Dakota	70	78.6	12.9	73	74.0	13.7	143	76.2	13.3
Wisconsin	356	82.9	11.8	385	70.6	18.2	741	76.5	15.1
Southeast	2,902	87.6	8.6	2,824	80.3	10.8	5,726	84.0	9.7
Alabama	273	86.4	7.0	245	76.7	14.3	518	81.9	10.4
Arkansas	166	88.0	8.4	179	76.5	12.8	345	82.0	10.7
Florida	238	83.2	10.9	283	79.5	12.0	521	81.2	11.5
Georgia	269	84.8	10.4	254	77.2	12.2	523	81.1	11.3
Kentucky	223	87.0	8.5	194	69.6	14.4	417	78.9	11.3
Louisiana	216	91.2	6.5	227	81.9	11.5	443	86.5	9.0
Mississippi	188	90.4	7.4	157	88.5	8.9	345	89.5	8.1
North Carolina	391	88.5	8.7	398	85.2	7.3	789	86.8	8.0
South Carolina	163	85.3	11.0	163	78.5	11.7	326	81.9	11.4
Tennessee	289	90.3	6.2	253	85.0	8.7	542	87.8	7.4
Virginia	274	90.1	8.4	276	85.1	7.2	550	87.6	7.8
West Virginia	212	85.4	9.9	195	74.9	11.8	407	80.4	10.8
West and Southwest	2,969	87.6	8.9	2,861	80.5	11.7	5,830	84.1	10.3
Arizona	80	80.0	18.8	64	82.8	10.9	144	81.2	15.3
California	1,048	89.6	7.4	1,063	84.0	9.6	2,111	86.8	8.5
Colorado	129	80.6	14.0	136	80.1	13.2	265	80.4	13.6
Idaho	71	85.9	11.3	72	73.6	12.5	143	79.7	11.9
Montana	64	85.9	10.9	60	66.7	16.7	124	76.6	13.7
Nevada	21	95.2	4.8	18	88.9	11.1	39	92.3	7.7
New Mexico	62	85.5	9.7	63	77.8	12.7	125	81.6	11.2
Oklahoma	240	90.4	7.5	236	78.0	12.3	476	84.2	9.9
Oregon	157	84.7	11.5	167	72.5	14.4	324	78.4	12.9
Texas	695	89.2	6.2	630	80.8	12.9	1,325	85.2	9.3

Table 11 (Con'd)

State and region	Men			Women					
	N (1)	full-time (2)	discontinuing (3)	N (4)	full-time (5)	discontinuing (6)	N (7)	full-time (8)	discontinuing (9)
Utah	114	78.9	14.9	84	83.3	14.3	198	80.8	14.7
Washington	259	85.3	12.0	235	77.9	11.5	494	81.8	11.7
Wyoming	29	82.8	13.8	33	66.7	18.2	62	74.2	16.1
Outlying Parts	52	82.7	13.5	68	82.3	10.3	120	82.5	11.7
Alaska	5	60.0	40.0	7	71.4	28.6	12	66.7	33.3
Hawaii	47	85.1	10.6	61	83.6	8.2	108	84.2	9.3
Total - 50 states plus D. C.*	13,690			13,081			26,771		
P		86.3	9.2		76.1	12.0		81.3	10.6
P'		86.2	9.2		75.6	11.9		81.0	10.5

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* Estimated percentages shown for P are based on "self-weighting" averages (i.e., the weight assigned to a given state estimate is proportional to the size of the analyzed sample in that state). Percentages shown for P' are based upon population strata weights (i.e., the weight assigned a given state estimate is proportional to the number of eligible examinees scoring above the sixty-third percentile in that state).

of the distribution of scores for a parallel test given a year later. Thus our sample of examinees ranking in the upper 30% of ability relative to juniors is less highly selected relative to seniors or graduates. In short, such "regression effects" would tend to offset to some degree the response biases associated with ability level. Consequently we probably should not place too much weight upon response bias as an explanation of the differences shown in Table 10.

Finally, a hypothesis which seems to provide the most valid explanation for these differences is that at any given ability level the population of Merit examinees is more highly motivated for college than the population of high school graduates. Although participation in the Merit test was useful in screening out graduates who have "withdrawn from the field", participation was probably too severe a criterion for defining interest in college. That is, it seems likely that use of test participation as an indicant of susceptibility to recruitment into higher education resulted in a greater number of "false positives" (graduates not taking the Merit test but interested in college) than of "misses" (graduates taking the Merit test but not interested in college).[1] Furthermore, the "false positives" may be presumed to enroll in college less frequently than examinees of comparable ability, since as we shall see in Chapter 8 recognition from the Merit program frequently aided students in winning scholarship assistance. This supposition, and the fact that only 85% of the graduates of 1959 attended schools offering the Merit test, argue that the present results over-estimate retention among potential entrants. In contrast, previous studies have undoubtedly underestimated retention among potential college entrants, since no effort was made to exclude students who had made decisions in high school which precluded college.

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[1] In this example we consider the decision to take or not take the Merit examination similar to passing or failing a "test" of educational motivation. The term "false positives," which is borrowed from medical diagnosis, usually refers to persons erroneously classified by a test as having the undesirable trait. In medical diagnosis, "positives" are cases where the test gives a positive indication of the disease. In psychological testing this terminology is somewhat confusing since the tendency is to construe "positives" as referring to cases having the desirable trait.

The most conservative way of interpreting these comparisons, therefore, is to consider the figures in Table 10 as defining the upper and lower boundaries for the true percentage of potential college entrants who enter college immediately. Thus, among potential college entrants ranking in the upper 30% of ability at least 58% but no more than 83% enroll in college immediately as full-time students. In other words, among potential college entrants in the upper 30% of ability at least 17% but no more than 42% fail to enroll in college immediately.

State and Regional Differences in College-Going Behavior

Although the percentages in Table 11 are shown in tenths of a per cent, clearly no such precision is justified in view of the small numbers of students in some of the state sub-samples. In general, comparisons between regions can be made with confidence, but comparisons between states are unreliable for states having less than 200 examinees in the analyzed sample.

Perhaps the most interesting findings in Table 11 are the relatively high retention rates found among students from the South and the low rates found among students from the North Central region. These results should be considered in relation to other data which suggests that the "holding power" of secondary schools in the South is lower than that for schools in other regions of the country. If we rank regions by the ratio of their 1959 public secondary school graduates to their 9th grade enrollment in 1955-56 (Schloss and Foster, 1959), we find that schools in the North Central region had the greatest holding power (73.5%), while those in the South had the least holding power (58.2%). In other words, the states and regions which exhibit the poorest holding power among public high school students show the highest rate of recruitment among potential college entrants. It appears that in the South the greatest losses of talent among students occur during the high school years; those who do graduate from high school and who are both qualified and disposed to enter college do so relatively frequently. In other regions, particularly in the North Central states, talent loss during the high school years is less, but loss tends to be relatively large during the transition from high school to college. One implication of these findings is that high school teachers and counselors more often represent the critical gate-keepers in the South; offers of financial aid or other incentives designed to encourage seniors to enter college are not likely to have their maximum impact until the holding power of secondary schools in the South is improved.

Differences in retention rates between regions were relatively small compared to the differences between states. The percentages of students enrolling in college immediately varied by region from a high of 84% for the western and southeastern states to a low of 78% for the north central states--a difference of about six per cent. In contrast, looking only at the retention rates for the 34 states having at least 200 students in the sample, retention rates varied from a high of about 89% for Mississippi and Connecticut to a low of 72% for Indiana--a difference of approximately 17%. The five states having the highest retention rates were Mississippi (89%), Connecticut (89%), Tennessee (88%), Virginia (88%), and California (87%); while the five states having the lowest retention rates were Indiana (72%), Iowa (73%), Nebraska (74%), Pennsylvania (75%), and Wisconsin (77%).

On the average the retention rate for men was about 10% higher than the rate for women, but there were marked differences between states in the differential recruitment of men and women. Thus among the 34 states Colorado and Connecticut had the smallest differences between the retention rates for men and women (about one per cent), while Michigan, Minnesota, and Nebraska had the largest differences in retention rates for men and women (18%). In general, the states with the lowest total retention rates were those having the poorest recruiting record among their women graduates. Since the range in retention rates (among the 34 states) was greater for women (from 65 to 88%) than for men (from 78 to 91%), it is not surprising that a state's total retention rate is more highly related to its retention rate among women (r=.95) than among men (r=.82).

Talent Loss at Selected Ability Levels

We have already seen that loss is smaller among students ranking in the upper 10% than among those ranking in the upper 30% of ability. Figure 2 shows how loss varies among Merit examinees classified in finer groupings (tabular data are presented in Table B-1 in Appendix B).

Talent loss was extremely small among examinees ranking in the upper five per cent of ability--almost 96% of the men and over 92% of the women enrolled in college immediately. Clearly additional programs of aid aimed at recruiting potential college students ranking in the upper five per cent of ability are not likely to reduce loss to any appreciable degree. To salvage a significantly greater share of our talented youth it is obviously necessary to recruit students at lower levels. Figure 2 shows there were sharp decreases in retention rates among examinees ranking just below the upper five per cent of ability, particularly among women. Extrapolating these rates to the total population of Merit examinees ranking in the upper 20% of ability an estimated 13.9%, or 22,500 examinees, did not enter college immediately as full-time students.

It is also clear that the "grey area" of partial utilization (unshaded spaces in Figure 2) includes an increasingly large proportion of the women as we look at lower levels of ability. Most of these women have enrolled in nursing or secretarial courses not leading to a Bachelor's degree. Thus higher education has to compete with other,

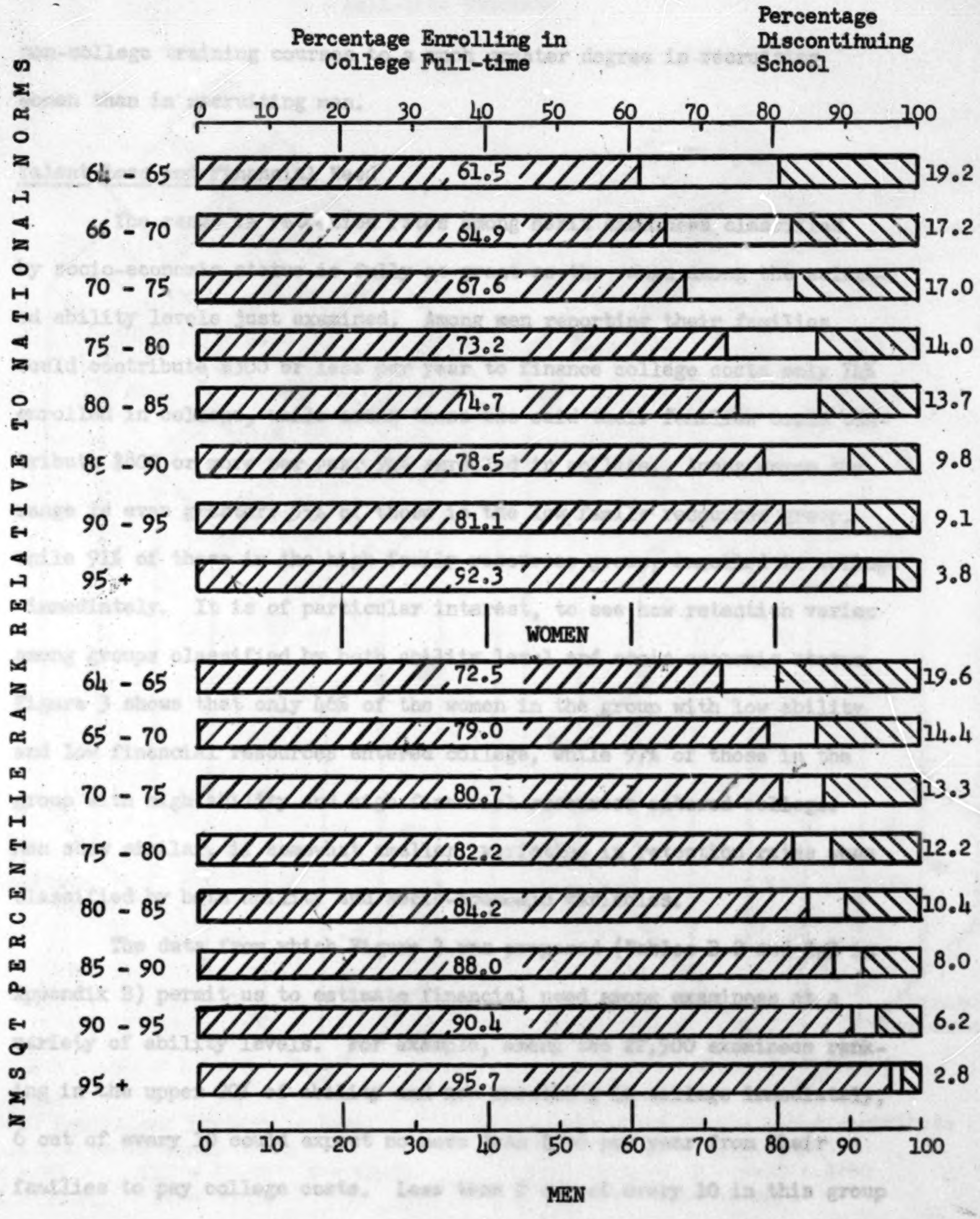


Figure 2 Talent Loss by Sex and Aptitude Level

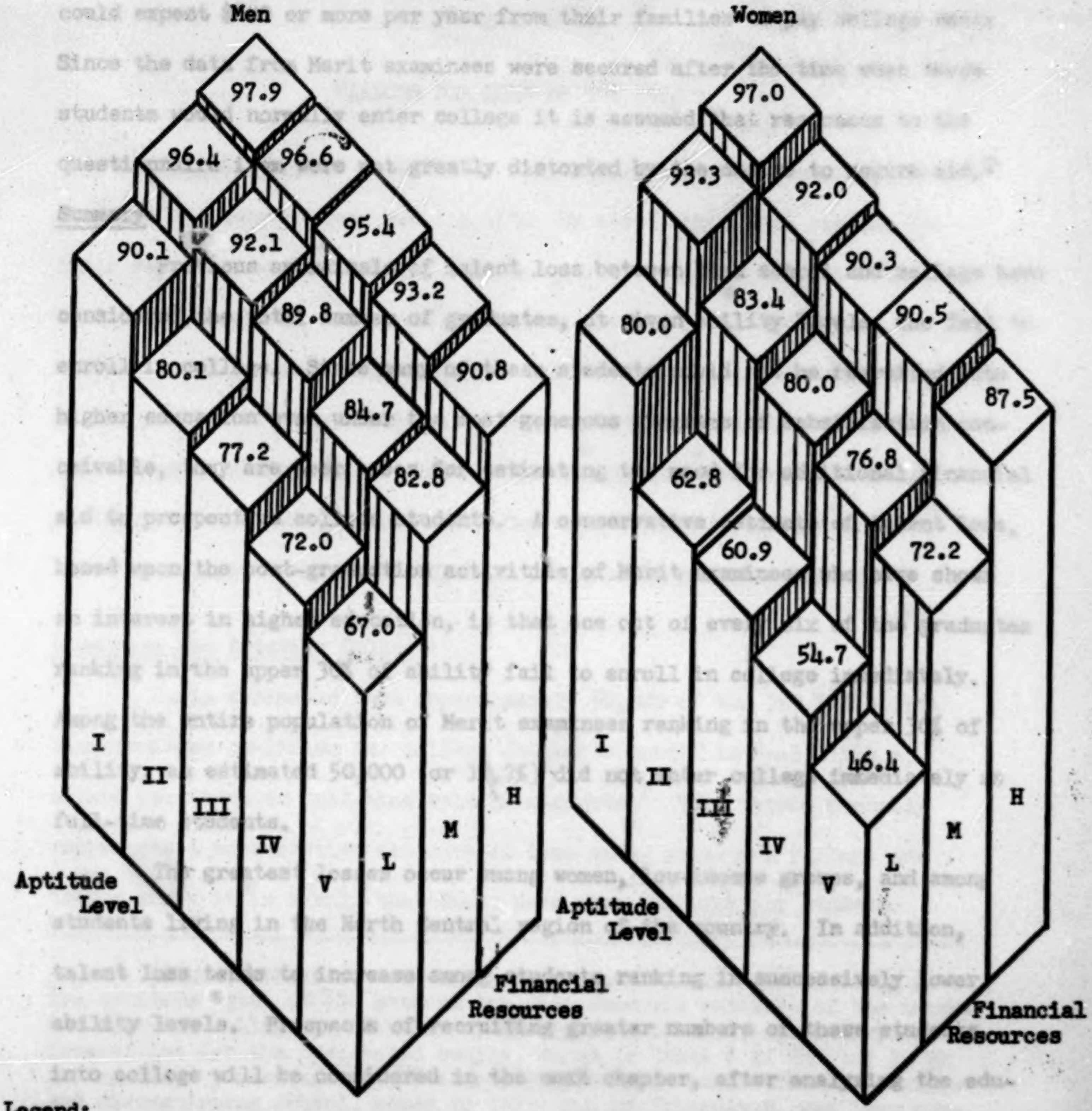
non-college training courses to a much greater degree in recruiting women than in recruiting men.

Talent Loss and Financial Need

The range in retention rates among Merit examinees classified by socio-economic status is fully as great as the range among the selected ability levels just examined. Among men reporting their families could contribute $300 or less per year to finance college costs only 74% enrolled in college, while among those who said their families could contribute $800 or more per year 94% enrolled in college. Among women the range is even greater: 55% of those in the low family resources group, while 91% of those in the high family resources group, enrolled in college immediately. It is of particular interest, to see how retention varies among groups classified by both ability level and socio-economic status. Figure 3 shows that only 46% of the women in the group with low ability and low financial resources entered college, while 97% of those in the group with high ability and high financial resources entered college. Men show similar, if somewhat smaller, variation in retention rates when classified by both ability and socio-economic variables.

The data from which Figure 3 was prepared (Tables B-2 and B-3 in Appendix B) permit us to estimate financial need among examinees at a variety of ability levels. For example, among the 22,500 examinees ranking in the upper 20% of ability and not enrolling in college immediately, 6 out of every 10 could expect no more than $300 per year from their families to pay college costs. Less than 2 out of every 10 in this group

Percentages Enrolling in College Immediately as Full-time Students



Legend:

NMSQT Equivalent Percentile Rank Relative to National Norms
I = 95 + III = 85-90 V = 64-79
II = 90-95 IV = 80-84

Estimated amount family could contribute each year to pay college costs:
L = $300 or less M = $400 - $700
H = $800 or more

Figure 3 Talent Loss Among Men and Women as a Function of Aptitude Level and Family Financial Resources.

could expect $800 or more per year from their families to pay college costs. Since the data from Merit examinees were secured after the time when these students would normally enter college it is assumed that responses to the questionnaire item were not greatly distorted by the desire to secure aid.[2]

Summary

Previous appraisals of talent loss between high school and college have considered the total number of graduates, at given ability levels, who fail to enroll in college. Since many of these students could not be recruited into higher education even under the most generous programs of subsidization conceivable, they are poor bases for estimating the need for additional financial aid to prospective college students. A conservative estimate of talent loss, based upon the post-graduation activities of Merit examinees who have shown an interest in higher education, is that one out of every six of the graduates ranking in the upper 30% of ability fail to enroll in college immediately. Among the entire population of Merit examinees ranking in the upper 36% of ability, an estimated 50,000 (or 16.7%) did not enter college immediately as full-time students.

The greatest losses occur among women, low-income groups, and among students living in the North Central region of the country. In addition, talent loss tends to increase among students ranking in successively lower ability levels. Prospects of recruiting greater numbers of these students into college will be considered in the next chapter, after analyzing the educational plans and attitudes of students discontinuing school.

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[2] To be sure some students wrote letters asking whether it was still possible to qualify for a National Merit Scholarship, but such enquiries were received from less than one per cent of the respondents to the questionnaire.

Chapter 4

REASONS FOR LOSS OF THE ABLE

In this chapter we consider only high-ability students who were disposed to enter college but did not. By ascertaining the reasons for their decisions we shall be in a better position to decide what kinds of incentives may be useful in recruiting more of these students into college. Getting more high-ability students into college is only part of the problem of talent loss; in addition we must find ways of reducing loss among able students who enroll in college but withdraw before completing the work for the Bachelor's degree. College retention and reasons for college withdrawal will be considered in a later chapter.

Examinees Not Entering College

It is estimated that approximately 50,000 of the 300,000 eligible examinees qualified for college failed to enroll in Fall, 1959 as either part-time or full-time college students.[1] This figure probably represents a conservative estimate of loss among potential college entrants since it is likely that there were many high-ability students interested in college who did not take the Merit examination.

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[1] Since both retention and response rates varied considerably by the aptitude level of the student the most accurate estimate of the number not entering college is obtained by multiplying 10 times the individual frequencies for the designated sample, shown in Table 8 of Chapter 2, by the combined percentages for students enrolling in other training courses and discontinuing school, shown in Table B-1 of Appendix B, and then combining these products over sexes and aptitude levels. This method assumes that non-respondents had the same retention rate as respondents. The estimate of loss among examinees would be greater if we assumed that non-respondents are more likely to have discontinued school than respondents.

The 50,000 examinees not enrolling in college came mainly from lower socio-economic groups. An estimated 60 per cent were from families which the students judged to be able to contribute no more than $300 per year for college costs, while over 80 per cent were from families judged to be able to contribute no more than $700 per year.

The reader will recall that only examinees with test scores above the 64th percentile relative to national norms were selected for study. Among the 50,000 examinees who are believed not to have entered college immediately an estimated 18 per cent had scores at or above the 90th percentile, while 43 per cent had scores at or above the 80th percentile.

As might be inferred from the poorer retention rate among women, the majority of the examinees not enrolling in college were women (64 per cent). Moreover, following their decision not to enroll in college, women more frequently enrolled in other types of training courses (e.g., nursing, secretarial, or religious training courses). Men seemed to have more often made the decision merely to postpone entry into college. Forty five per cent of the men, as compared with 19 per cent of the women, not enrolling in college reported they planned to enroll within the next year or two. Figure 4 shows more clearly how enrollment in non-college training courses and plans to defer entry into college varied among men and women.[2]

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[2] The percentages and N's shown in Figure 4 are based only upon data for the analyzed sample. If we were to weight data for ability levels by the method previously described in footnote 1 the estimated percentage discontinuing school among the entire group of 50,000 examinees not enrolling in college would be slightly greater.

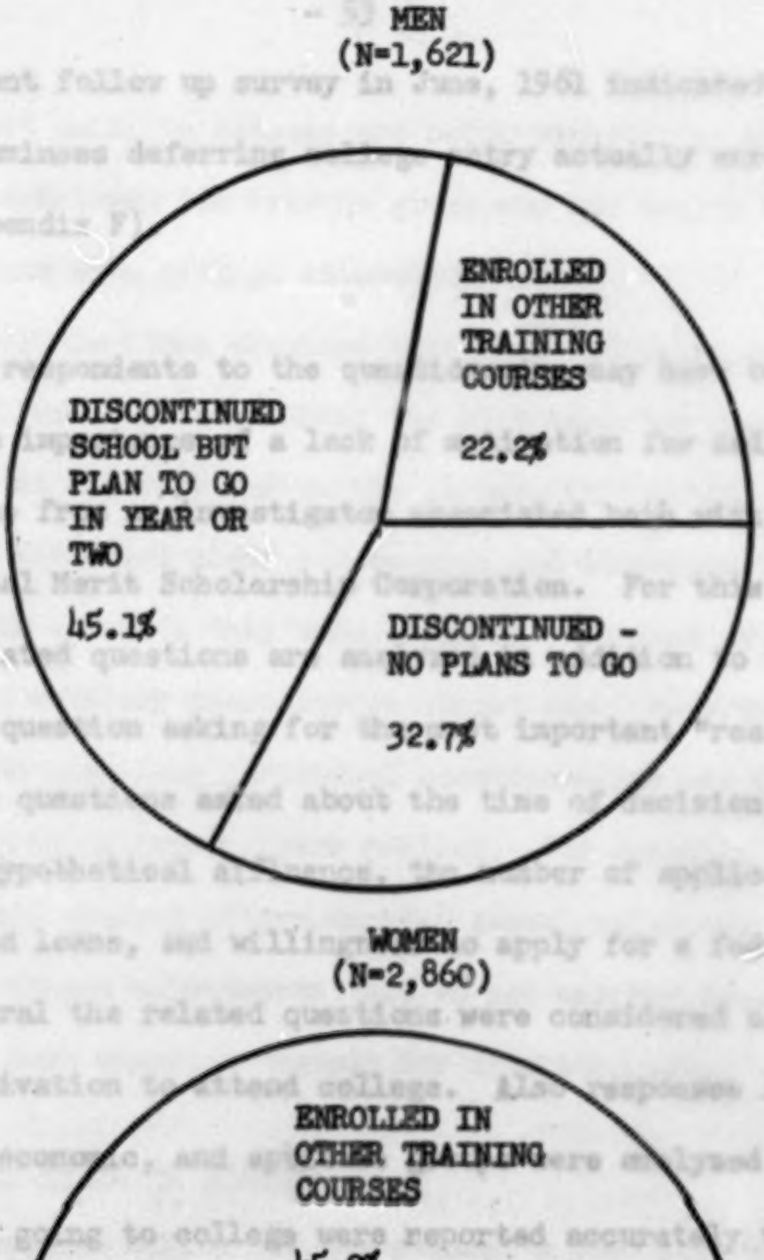

Figure 4 Post-Graduation Activities and Plans of Examinees Not Enrolling in College

A subsequent follow up survey in June, 1961 indicated that only about half of the examinees deferring college entry actually enrolled within a year or two (cf. Appendix F).

Method

Obviously respondents to the questionnaire may have been inclined to minimize the importance of a lack of motivation for college, since the mail survey came from an investigator associated both with a university and with the National Merit Scholarship Corporation. For this reason responses to a number of related questions are analyzed in addition to the student's responses to a question asking for the most important "reason" for not going to college. These questions asked about the time of decision, attitudes toward college under hypothetical affluence, the number of applications made for scholarships and loans, and willingness to apply for a federal loan to pay college costs. In general the related questions were considered as rough indices of the strength of motivation to attend college. Also responses from students in different sex, socio-economic, and aptitude groups were analyzed separately. If reasons for not going to college were reported accurately then we would expect certain kinds of consistencies to appear. For example, students from families with limited financial resources should mention more frequently financial barriers as the most important reason for discontinuance, students with less aptitude for college should exhibit less interest in further study, etc.

As a further check upon the consistency of the student's responses we shall consider a correlational analysis relating a larger pool of background traits to college attendance. Here again, if the real reasons for not going to college are being reported we should find some correspondence between the reasons given and the traits having the highest correlations with college attendance.

Although the items examined here were scattered throughout the questionnaire, and the item asking the most important reason for discontinuance came at the very end of the survey, it is still possible that some students perceived their relatedness and attempted to give replies consistent with a facade they were assuming. Whether or not this actually occurred with any frequency we cannot say. However, the impression gained from examining individual questionnaires was that many students were giving extremely frank replies. For example, a number of students who had engaged in pre-marital sexual relations from which the girl became pregnant volunteered "had to get married because of pregnancy" as the most important reason for discontinuance.

Reasons for Not Going to College

The question asking for the student's most important reason for not going to college contained 10 fixed alternative replies (the nine most frequently checked are shown in the footnote of Table 12) and a space for write-in responses. Students writing in responses equivalent to one of the fixed alternatives were classified as if they had checked the corresponding fixed alternative. Among the students making write-in responses which could not be classified in this way only two reasons appeared with any frequency: 6 per cent gave as their reason "plans to enter other kinds of training courses" and 2 per cent reported they "wanted to work or travel before entering college."

Among men financial need and entry into military service in that order were the major reasons for drop-out. Among women financial need, early marriage, and lack of interest in study in that order were the primary reasons checked. By a wide margin financial need was the greatest single deterrent both among men and women (42 and 39 per cent, respectively).

Financial need was cited much more frequently as the primary deterrent by students from families with limited financial resources. For the low, moderate, and high levels of family financial resources, shown in Table 12, the percentages of men citing financial need were 56, 30, and 9, respectively. The corresponding percentages for women were 53, 28, and 8, respectively. Clearly this variation is in the direction we should expect if truthful replies were elicited.

How should deterrents to college attendance vary among men and women and among students with different aptitudes for college? Since women less frequently enter occupations requiring a college education they can be expected to exhibit less interest in college. Also students with test scores nearer the cut-off score used for determining qualification for college can be expected to have less interest in pursuing a course of study in which the outcomes are problematical. Both of these expectations are confirmed when we compare the frequencies of different reasons for sex and aptitude groups. As can be seen in Table 12 or 13 a greater percentage of the women than of the men checked the reason, "Don't need a college education for my intended occupation" (21% vs. 6%). Clearly women tended to

Table 12

Reasons for Discontinuing School as a Function of
Sex and Family Financial Resources
(reported by students not enrolling in college immediately)

Student's estimate of amount family could contribute each year for college costs	Total number of students at each level	Percentage giving each response in reply to "Check the most important reason why you are not going to college."*									Other unclassified responses	Number of students answering item
		1	2	3	4	5	6	7	8	9		
I Men												
$300 or less	869	56.0	3.0	4.0	27.0	4.0	.7	1.0	1.0	.5	11.0	809
$400 - $700	341	30.0	3.0	6.0	33.0	6.0	.3	2.0	4.0	2.0	20.0	311
$800 or more	271	9.0	2.0	14.0	32.0	9.0	.0	3.0	4.0	1.0	34.0	227
Indeterminate	140	37.0	4.0	8.0	45.0	8.0	8.0	1.0	1.0	.0	12.0	78
Sub-total	1621	41.7	2.5	6.4	30.2	5.1	.9	1.8	2.2	.8	16.9	1425
II Women												
$300 or less	1605	53.0	21.0	16.0	.5	2.0	3.0	1.0	.5	.9	14.0	1342
$400 - $700	563	28.0	22.0	27.0	.0	3.0	3.0	1.0	.5	.7	24.0	419
$800 or more	465	8.0	32.0	32.0	.0	2.0	1.0	.6	2.0	3.0	28.0	320
Indeterminate	227	19.0	41.0	21.0	.0	1.0	1.0	.0	1.0	.0	24.0	151
Sub-total	2860	39.2	23.8	20.5	.3	2.1	2.4	1.1	.8	1.1	18.5	2232
Totals (Men and women)	4481	40.2	15.5	15.0	12.0	3.2	1.8	1.4	1.3	1.0	17.9	3657

*Reasons for discontinuance are as follows:

(1) Couldn't afford it
(2) Wanted to get married
(3) Don't need a college education for my intended occupation
(4) Plan to fulfill military obligation first
(5) My grades aren't high enough
(6) My parents haven't encouraged me
(7) Don't think I would fit in with college students
(8) Couldn't get admitted to the college I wanted to attend
(9) Illness

Percentages do not total to 100 since some students checked more than one reason.

exhibit less interest in college. Also students having test scores placing them at the 95th percentile or higher less frequently checked this reason than students with lower test scores, and the men mentioning this reason most frequently were those with the lowest test scores (Table 13).

Responses to Related Questions

Attitudes under Hypothetical Affluence. One implication of the generalization that the importance of financial need as a deterrent varies with the financial resources of the family is that if we remove this deterrent, leaving other deterrents unchanged, we should find greater readiness to enroll in college among students from poorer families. Students who are asked whether they would go to college under a hypothetical condition in which they had more money should say "Yes" more frequently to the extent that the financial resources of the family are limited. This expectation is clearly confirmed by the results shown in Table 14, where we see that 60 per cent of the students from the low financial resources group said "Yes," as compared with 47 per cent and 24 per cent of the medium and high financial resources groups, respectively. Replies to this question did not vary appreciably by ability of the student, a finding consistent with the relatively small differences between ability groups in the importance attributed of financial need as a deterrent.

The results in Table 14 suggest that the number of students who

Table 13

Reasons for Discontinuing School as a Function of Sex and Aptitude Level
(reported by students not enrolling in college immediately)

Aptitude Level (equiv. percentile rank relative to national norms	Total number of students at each level	Percentage giving each response in reply to "Check the most important reason why you are not going to college."*									Other unclassified responses	Number of students answering item
		1	2	3	4	5	6	7	8	9		
I Men												
64 - 79	906	41.5	2.9	7.7	30.8	6.4	.5	1.8	2.4	.6	13.7	791
80 - 84	226	45.3	2.5	4.4	26.1	5.4	3.0	2.0	2.5	.5	19.7	203
85 - 89	189	42.6	3.0	5.3	33.1	4.1	.6	1.2	.6	.6	18.9	169
90 - 94	208	39.5	.5	5.4	30.3	1.1	1.1	1.6	1.1	2.2	22.7	185
95 +	92	37.7	2.6	2.6	28.6	1.3	.0	2.6	5.2	1.3	24.7	77
Sub-total	1621	41.7	2.5	6.4	30.2	5.1	.9	1.8	2.2	.8	16.9	1425
II Women												
64 - 79	1577	40.6	23.3	20.8	.3	2.9	2.6	1.2	1.0	.9	16.9	1212
80 - 84	405	36.5	26.0	22.0	.0	.9	1.9	.6	.3	1.2	19.2	323
85 - 89	342	38.1	30.8	21.6	.4	1.1	2.2	.7	.7	1.1	19.0	273
90 - 94	414	39.8	23.4	19.5	.3	1.5	2.1	.9	.9	2.1	21.9	329
95 +	122	31.6	31.6	12.6	1.1	.0	3.2	3.2	.0	.0	24.2	95
Sub-total	2860	39.2	23.8	20.5	.3	2.1	2.4	1.1	.8	1.1	18.5	2232
Totals (men and women)	4481	40.2	15.5	15.0	12.0	3.2	1.8	1.4	1.3	1.0	17.9	3657

*Reasons for discontinuance are as follows:

(1) Couldn't afford it
(2) Wanted to get married
(3) Don't need a college education for my intended occupation
(4) Plan to fulfill military obligations first
(5) My grades aren't high enough
(6) My parents haven't encouraged me
(7) Don't think I would fit in with college students
(8) Couldn't get admitted to the college I wanted to attend
(9) Illness

Table 14

College-Going Attitudes as a Function of Aptitude Level, Family Financial Resources, and Sex (reported by students not enrolling in college immediately)

Aptitude Level *	Percentage saying "Yes" to "would you go to college if you had more money? ‡									
	Estimated amount family could contribute for college per year									
	$300 or less		$400 - $700		$800 or more		Indeterminate		All respondents to question	
	N	%	N	%	N	%	N	%	N	%
	I - Men									
64-79	422	73	168	59	102	39	43	53	735	64
80-84	112	70	36	75	23	39	11	55	182	66
85-90	98	77	31	55	19	47	3	67	151	68
90-95	105	71	35	60	19	21	11	36	170	61
95+	38	79	14	64	13	15	4	50	69	62
Sub-totals	775	73	284	61	176	36	72	51	1307	64
	II - Women									
64-79	729	51	216	39	152	14	85	19	1182	42
80-84	188	56	60	38	41	17	23	22	312	45
85-90	154	55	55	29	40	28	9	22	258	44
90-95	187	49	63	40	54	15	15	27	319	40
95+	51	55	17	47	17	6	2	--	87	43
Sub-totals	1309	52	411	38	304	16	134	20	2158	42
Men and Women	2084	60	695	47	480	24	206	31	3465	51

*Equivalent percentile rank relative to national norms.

‡N's in the table show the number of respondents to the question.

might have been recruited into college if financial aid had been available is considerably greater than we would estimate on the basis of the reported reasons for discontinuance. Forty two per cent of the men said financial need was the most important reason for not going to college. In contrast, 64 per cent of the men said they would go to college if they had more money. Among women who did not enroll in college 39 per cent said financial need was the most important deterrent, but 42 per cent said they would go to college if they had more money. Moreover, there is reason to believe that even these figures underestimate the proportions who might have been recruited into college by increased opportunities for financial aid. Large proportions of both the women and the men reported they had entered other training courses following graduation from high school, and presumably many of them found it difficult to imagine themselves reversing and interrupting their new commitments even supposing they now had enough money to pay college costs. Obviously it is important to this argument to know when these students made their decisions not to go to college. If most of them made their decisions very early in high school then increased opportunities for financial aid would not be expected to markedly alter these estimates. But if a large majority made their decisions late in high school then the prospects of reducing talent loss by financial aid may be even better than the figures in Table 14 suggest.

Time of Decision. Responses of students to the question, "When did you make your decision not to go to college immediately after high school?" are shown in Table 15. Eighty per cent of the men and 77 per cent of the women reported making their decisions during the junior year of high school or later. Thus it appears that about four out of every five of the examinees

Table 15

Time of Decision Not to Go to College Immediately (reported by students not enrolling in college immediately)

Aptitude Level	Percentage saying they made their decision during the junior year of high school or later									
	Estimated amount family could contribute for college per year									
	$300 or less		$400 - $700		$800 or more		Indeterminate		All respondents to question	
	N	%	N	%	N	%	N	%	N	%
					I - Men					
64-79	414	74	171	79	106	75	45	80	736	76
80-84	112	81	40	98	26	88	11	73	189	85
85-90	104	85	33	73	22	100	3	100	162	85
90-95	107	84	35	89	22	95	12	83	176	86
95+	39	85	14	93	16	100	2	100	71	90
Sub-totals	776	78	293	83	198	81	73	81	1340	80
					II - Women					
64-79	706	74	212	79	156	79	81	73	1155	75
80-84	189	76	61	79	41	90	22	50	313	77
85-90	156	78	56	77	43	88	9	44	264	78
90-95	187	79	61	82	56	93	15	73	319	82
95+	55	82	17	94	19	89	3	100	94	86
Sub-totals	1293	76	407	80	315	85	131	67	2146	77
Men and Women	2069	77	700	81	513	83	204	72	3486	78

not enrolling in college were still considering college as late as the junior year of high school. In view of this finding it does indeed seem likely that if these students had had increased opportunities to obtain financial aid *at the time they made their decisions*, the percentages enrolling in college would have been greater than Table 14 implies.

There was clearly a tendency for time of decision to vary systematically according to the ability level of the student. For example, 90 per cent of the men with test scores above the 95th percentile made late decisions while only 76 per cent of those with test scores below the 80th percentile made late decisions. A similar tendency appears for women. These findings are consistent with the tendency previously noted for less able students to exhibit less interest in college.

Instrumental Behaviors. If it is true that financial need was the greatest single deterrent to college attendance for these students, and if the majority were seriously interested in higher education, then we might expect to find that they have made repeated attempts to obtain financial aid. We do in fact find that some students made repeated attempts to obtain aid but not nearly as many we might expect from the preceding analysis. Only one third of these students reported they made two or more applications for scholarships and only three per cent said they had actually applied for a college loan, (although over half of the students said they would be willing to apply for a federal loan if they need help to pay college costs).[3] The discrepancy between the number actually applying for loans and the number saying they would be willing to apply for a federal loan can be interpreted in a number of ways: one possibility is that these students were not as highly motivated to enroll in college as their expressed attitudes suggest; another is that they were not familiar with college loan opportunities; still another is that loans have negative values which serve as additional deterrents (e.g., obligations to repay the loan and interest during a period when the graduate will be starting his career and can anticipate other financial obligations).

Apparently decisions to apply for scholarships or loans are determined by a variety of factors in addition to the student's motivation to seek advanced training. First, the student's financial need and his expectations of success will partly determine whether he applies for a scholarship. Table 16 shows that students with the greatest financial need applied for scholarships most often while students with the least financial need applied least often. Also students with extremely high test scores were more likely to apply than students with lower test scores. Presumably students who did not have outstandingly high test scores perceived the chances of their obtaining a scholarship to be quite low (as in fact they were) and

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[3] Students were instructed to count participation in the National Merit Scholarship Qualifying Test as one scholarship application. Tabular data on applications for college loans and willingness to apply for a federal loan are presented in Appendix C.

Table 16

Applications for Scholarships
(reported by students not enrolling in college immediately)

Aptitude Level	Percentage making two or more scholarship applications									
	Estimated amount family could contribute for college per year									
	$300 or less		$400 - $700		$800 or more		Indeterminate		All respondents to question	
	N	%	N	%	N	%	N	%	N	%
					I - Men					
64-79	401	26	167	25	127	21	36	19	731	25
80-84	104	34	48	17	33	24	8	63	193	29
85-90	106	36	38	34	24	21	3	33	171	33
90-95	107	30	40	43	25	32	12	17	184	32
95+	40	48	16	38	18	50	5	40	79	46
Sub-totals	758	30	309	28	227	25	64	27	1358	29
					II - Women					
64-79	778	35	261	30	198	24	88	28	1325	32
80-84	201	35	70	29	51	33	24	25	346	33
85-90	169	42	65	37	60	30	13	38	307	38
90-95	212	47	76	38	71	39	13	23	372	43
95+	66	56	21	48	23	57	3	--	113	53
Sub-totals	1426	38	493	33	403	31	141	28	2463	35
Men and Women	2184	36	802	31	630	29	205	27	3821	33

chose not to incur the costs of making additional applications.

Second, the analysis of responses to other questions indicates that loans may indeed have a number of associated negative values. Students who said they would not be willing to apply for a federal loan indicated their reasons as follows: 68 per cent reported they "don't like the idea of being indebted"; 7 per cent said they "would never be able to pay it back"; 4 per cent said they "don't like the idea of the oath and affidavit" (associated with a federal loan). Presumably many students who said they would be willing to apply for a federal loan share some of these same misgivings. When students who said they would go to college if they had more money were asked how much more money they would require, a fourth needed $900 or more per year, while over three fourths needed at least $500 per year. The relatively great financial needs of these students and their reluctance to become indebted makes it understandable that few actually applied for college loans.

In short, the instrumental acts discussed here should occur more often when motivation for college is high but, like most human acts, they are complexly determined. There is the possibility that the acts of applying for numerous scholarships and for college loans were inhibited by other factors even when motivation for college was high. For these reasons we do not consider the frequency of instrumental steps taken toward obtaining financial aid to be an unambiguous indicator of interest in college.

Background Traits Related to College Attendance

So far we have considered only those background traits most obviously related to reported reasons for discontinuance. Additional background traits which previous studies have shown are related to college attendance were incorporated in a correlational analysis in which we studied the power of the trait to differentiate students enrolling in college full-time from those who did not. The chief virtue of this analysis is that it permits us to estimate the magnitude of the relationships involved, and thereby to order traits with respect to their closeness of association to college attendance. In general, we expected to find considerable congruence between the traits most clearly differentiating the two groups and the frequency of reported reasons for not going to college. Thus Table 17 provides another check upon the consistency of the student's responses.[4]

The 21 traits shown in Table 17 have been ordered by the magnitude of the tetrachoric correlation coefficient shown in the last column. It can be seen that three of the four traits showing the highest correlation with college attendance clearly correspond to the two reasons

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[4] One problem arising in the analysis of returns relates to students who did not reply to particular items on the questionnaire. Since a partial correlation analysis (reported in a later chapter) was to be made from the products of this analysis it was considered too wasteful of the data to confine the analysis only to subjects responding to every item. Such a rule would have drastically reduced the number of subjects whose questionnaires could be used. The rule finally adopted was to consider a non-respondent to a particular item as if he had given one of the response alternatives weighted negatively providing no more than 5 per cent of the sample failed to reply to the item. Of the 21 items discussed in Table 17, only three failed to meet this criterion: student's estimate of family's gross annual income, student's estimate of the amount his family could contribute each year for college costs, and percentile rank in high school graduating class. Percentages not responding to these items were 31, 6, 8, respectively. Since these three items are of considerable interest they are included in Table 17, but percentages and correlations for these items are based only on subjects for whom replies were received. Since only about 70 per cent of the students gave estimates of the family's gross annual income, the data may give an erroneous estimate of the correlation between family income and college attendance.

Table 17

Background Traits Related to College Attendance

Background trait	Percentage of each group with given trait: Not enrolling in college full time (N=1,022)*	Percentage of each group with given trait: Enrolling in college full time (N=5,083)*	Tetrachoric correlation between trait and college attendance
1. Took the CEEB exams	32	70	.51
2. Received one or more scholarship offers	19	41	.49
3. Student estimates family could contribute $800 or more each year for college costs	16	48	.48
4. Not married nor planning to be married within coming year	80	96	.48
5. All of friends going to college	10	34	.44
6. College preparatory course taken in high school	68	88	.40
7. Father has professional or semi-professional occupation	23	46	.35
8. Mother had at least some college	19	42	.35
9. Applied for two or more scholarships	32	57	.34
10. Father had at least some college	25	47	.32
11. Seven or more semesters of mathematics taken in high school	30	53	.31
12. Family's gross annual income is $5,000 or more	28	49	.30

Table 17 (Cont'd)

Background trait	Not full time students	Full time students	Tetrachoric correlation
13. Applied for a loan at some college	3	11	.30
14. NMSQT score of 108 or higher (percentile rank of 85 or higher)	33	54	.28
15. Lives with both parents	75	88	.28
16. Male	37	54	.24
17. 150 or more books in home	34	50	.23
18. Percentile rank in high school class of 85 or higher	40	54	.20
19. Student reports it was a sign of prestige and distinction in his high school to be a good student	78	82	.08
20. Encouraged "quite a lot" to go to college by high school teachers and counselors	56	60	.06
21. Home within commuting distance of college	62	65	.04

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*Data are based upon a 25 per cent random sample of respondents to the Fall, 1959 follow-up survey, except that respondents not replying to the question "How many offers of scholarship aid have you received?" were not sampled. Percentages and the correlation for sex (item 16) are based upon all respondents. Because of non-response to items the total N's for items 3, 12, and 18 were 5,762, 4,227, and 5,603, respectively.

mentioned most often for not enrolling college. The student's success in winning one or more scholarship offers and his estimate of the amount his family could contribute for college costs have correlations of .49 and .48, respectively, with college attendance; both traits are related to the student's financial need, the deterrent most often mentioned by drop-outs. College attendance has a correlation of .48 with marriage plans, and early marriage was the reason ranking second in importance among drop-outs.

A lack of interest in college study was the reason ranking third in frequency of mention, and a number of the traits listed in Table 17 confirm the importance of a lack of motivation as a deterrent to continued study. Drop-outs were less often enrolled in college preparatory courses and took fewer mathematics courses in high school. Also there appeared to be considerable difference in the cultural atmosphere of the homes of the drop-outs and college-attenders. For the most part, the parents of drop-outs were not employed in professional or semi-professional occupations; they did not attend college themselves; and they have fewer books in their homes.

The best predictor of college attendance is whether or not the student took the College Entrance Examination Board tests, though it is not appreciably better than the three traits ranking just below it in Table 17. CEEB tests are most frequently required for admission to institutions which are privately controlled and which have relatively high tuitions. Consequently it is likely that students who take the CEEB tests tend to be either relatively well-to-do or outstandingly qualified for college so that they believe their chances of obtaining aid from these schools are good. At any rate it does not seem appropriate to construe the act of taking the CEEB tests as a simple measure of interest in college. In the absence of more information about participants in the CEEB testing program, we conclude that the high correlation of this trait with college attendance is ambiguous: it neither confirms nor refutes the hypothesis that there is congruence between the reported reasons for discontinuance and the background traits diagnostic of college attendance.

Previously we mentioned that the question about reasons for discontinuance contained 10 fixed alternatives, but only the nine most frequently checked were included in Table 12. The omitted alternative was "most of my friends aren't going to college." This reason was checked by only four men and five women. In contrast, Table 17 shows that there was a correlation of .44 between college attendance and student responses to the question, "Of the people your own age with whom you spend most of your free time, how many plan to go to college or are already going to college?" Clearly there is a discrepancy between the magnitude of this correlation and the lack of importance attributed to peer group influences as a reason for discontinuance. It should be noted that the question was phrased in the present tense and administered during a period when most of the college-attenders were away at college. Consequently the obtained correlation may be a spuriously high estimate of the predictive value of this item when it is administered to students who are still in high school. Another question related to peer group influences asked the student to give a retrospective report of his high school group: "In your high school group, was it a sign of prestige and distinction to be a good student?" Table 17 shows that responses to this question had only a negligible correlation (r = .08) with college attendance. We conclude that the available data on the relation between peer group norms and college attendance are ambiguous, and therefore do not provide a clear-cut check upon the lack of influence attributed to peers in deciding not to enroll in college.

Only one of the remaining traits in Table 17 requires brief mention. The relatively low correlation of .30 between college attendance and the student's estimate of his family's gross annual income may be due to incomplete data. About a third of the students did not provide estimates of family income. Therefore the obtained correlation may err considerably from that describing the relationship for the entire sample.

Prospects for Reducing Loss between High School and College

An analysis of the reasons high-ability Merit examinees give for not enrolling in college and of their responses to related questions indicates that financial need is probably the most important single deterrent to college attendance. Although it was not possible to demonstrate complete congruency between reasons cited for discontinuance and responses to other questionnaire items, there was sufficient agreement to warrant the conclusion that financial need consistently emerged as a primary deterrent for drop-outs in this population. No doubt the chances of reducing talent loss among these students are better than they would be for a high-ability group which had not demonstrated previous interest in college. Since a "test" of motivation for college was used in selecting the study sample, it is not surprising that a relatively small percentage of these students exhibited a lack of interest in advanced training.

Certain groups of examinees were clearly more disposed to enroll in college than others. Men can be recruited for college more easily than women, and students with high test scores more easily than those with low test scores. If recruitment takes the form of financial aid, students from families with low financial resources can be expected to be recruited more easily than those from families with high financial resources.

It appears that at least 60 per cent of the men and 40 per cent of the women not enrolling in college could have been recruited for higher education if suitable financial aid had been available. A more optimistic estimate, based upon the time of decision, is that perhaps 80 per cent of the men and 75 per cent of the women could have been recruited into college if incentives had been provided as early as the junior year of high school.

In the next chapter we shall report evidence which suggests that scholarship offers were in fact effective in recruiting some of the Merit examinees into college. Unfortunately the small number of these students obtaining college loans meant that it was impossible to assess the effectiveness of loan programs in reducing talent loss. However, student attitudes toward loans reveal considerable ambivalence. While about half of the drop-outs said they would be willing to apply for a federal loan if they needed help to pay college costs only three per cent reported they actually applied for college loans. Loan opportunities seem to present negative as well as positive images to students, and will probably prove to be much less effective than scholarship offers as means of reducing talent loss.

Chapter 5

SCHOLARSHIPS AS INCENTIVES FOR COLLEGE RECRUITMENT

What can be done to motivate talented youth to seek further specialized training? Scholarship programs, awards for scholastic achievement, and other forms of social recognition have often been used to increase the student's motivation for higher education, but controlled studies of the effectiveness of such devices have been rare. This chapter briefly reviews methodological problems in conducting well-controlled studies of the effects of scholarships and describes an analysis designed to test the hypothesis that scholarship offers cause some students to enroll in college who would not otherwise do so. In Chapters 6 and 7 we shall examine data on the major sources of scholarships and the kinds of students who are currently most successful in obtaining scholarships. Chapter 8 presents an analysis of the effects of social recognition upon the college-going behavior and study plans of Merit examinees.

Regression and Ex Post Facto Experiments

With few exceptions, previous studies of the effectiveness of programs for recruiting high-ability students into college have employed "ex post facto experiments." Following the procedures described by Chapin (1938) and Greenwood (1945) this mode of analysis typically compares an experimental and control group selected through matching. In such studies the groups are presumed, as a result of matching, to have been equivalent prior to the exposure of the experimental group to some potentially change inducing event (the "experimental treatment"). If the groups differ on subsequent measures it is inferred that the experimental treatment has caused the observed differences.

Two studies of the "effects" of scholarship and recognition awards in the National Merit Scholarship Program may be cited to illustrate the limitations of such designs. The first is a study reported by Thistlethwaite (1959a) on effects of financial aid. A comparison was made of the college-going behavior of scholarship winners and of near-winners who did not receive scholarships. The two groups were matched on sex, aptitude test scores, percentile rank in high-school class, and family resources available for sending the student to college. Scholarship winners were found to attend college more frequently (a) at the college of first choice, (b) at colleges with small freshman classes, (c) at privately controlled colleges, and (d) at colleges with religious affiliations. As might be expected, the matched near-winners had significantly greater aptitude scores and higher class ranks than the total group of near-winners, while the matched scholarship winners had significantly lower aptitude scores than the total group of winners. Thus even though the groups were matched, differential regression-toward-the-mean effects could account for the observed differences. To the extent that there were errors of measurement on the traits used to match students the experimental group was apt to contain subjects whose trait scores were too low through error, while the control group was apt to contain subjects whose trait scores were too high through error. Consequently the observed differences could have been due to "regression effects" rather than to the effects of scholarships.

In a second ex post facto study reported by Thistlethwaite (1959b), two groups of near-winners were matched on sex, verbal aptitude score, geographical region, and father's occupational class in order to study the effects of public recognition. One group received greater recognition in the Merit program than the other. It was found that the group receiving greater recognition more often planned to seek the MD. or Ph.D. degree, more often planned to become college teachers or scientific researchers, and were more successful in winning scholarships from other scholarship granting agencies. Again the interpretation of these results is difficult since the alternative, rival hypothesis that differences were due to regression effects cannot be ruled out. A subsequent re-analysis of the data for this study by Thistlethwaite and Campbell (1960), using regression analysis methods, confirmed the effects of recognition upon success in winning scholarship aid, but failed to confirm the inference that recognition affects the student's attitudes and career plans.

The problem of controlling regression effects in ex post facto designs has led to the suggestion that we attempt to match individuals on the basis of predicted true scores on measures of background traits (Thorndike, 1942). However, the predicted true score for each individual must be determined from the regression equation for his own population, and for groups when the special treatment is not applied. Unfortunately such matching is usually impossible in situations where we wish to use the ex post facto design, since we typically cannot obtain pretest and posttest measures on control variables for "experimental" groups from which the special treatment has been withheld. If we had the power to withhold the treatment from some subjects we would be able to test our causal hypothesis by experiment with true randomization. In short, the suggested procedure for controlling regression effects in such studies presupposes knowledge which we typically cannot obtain.

Because of the difficulty in controlling extraneous variables in matched group studies, alternative analyses were used in the present study to assess the effects of scholarship offers upon college attendance. Similarly, the analysis in Chapter 8 of the effects of social recognition employs an alternative method which avoids the ambiguities of matched group designs.[1]

Partial Correlation and the Control of Extraneous Variables

In principle the partial correlation technique permits us to determine how much of the correlation between two variables is due to heterogeneity with respect to any number of related variables. The two variables of primary interest are the number of scholarship offers received by an examinee and his college-going behavior. For the random sample of 6,105 examinees described in the previous chapter the tetrachoric correlation between these variables was .49; that is, the more scholarship offers received the more likely the examinee was to enroll in college immediately as a full-time student.[2] Unfortunately, there are many background traits (such as rank in high school graduating class) which could be expected to influence this correlation. Thus the valedictorians and salutatorians of a graduating class are both more likely to enroll in college and to receive scholarship offers. If we were to control high school rank by partialling its effects out statistically we would find that the correlation of .49 is thereby reduced. In general when the trait to be partialled out is positively correlated with both college attendance and success in winning scholarship offers the first-order partial correlation will be smaller than the zero-order correlation. On the other hand, if the trait is positively correlated with one of these primary variables but negatively correlated with the other, controlling the trait will generally raise the correlation.

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[1] Discussions of additional difficulties involved in studies using matched groups may be found in the papers by Stanley and Beeman (1958) and Campbell and Stanley (in press).

[2] Offers of scholarships, rather than the holding of scholarships, were studied since one cannot hold a scholarship without enrolling in college. The correlation between college attendance and holding a scholarship is spurious and cannot be interpreted since one of the cells of the four-fold table for computing the correlation is necessarily zero.

Ideally, we would like to simultaneously partial out all relevant background traits on which our survey questionnaire provided data. However, as Peters and Van Voorhees(1940, p.245) point out,

> partial correlations are notoriously affected by errors in measurement. The final values of the partials turn upon small differences in the zero-order r's, especially as the number of variables increases. It is therefore very important that the validity and reliability of the basis r's be high, and the more so if the number of variables is considerable. Hence to justify the application of this technique to problems of more than three or four variables, the number of cases upon which the r's are based must be large.

While the number of cases on which these correlations are based is quite large (N=6,105), the reliability of the specific measure of correlation used (tetrachoric coefficients) is low. Consequently it was desirable to reduce the number of background traits which were simultaneously controlled in the analysis.

One method of redu[illegible] the number of background traits to be controlled simultaneously is to study each trait singly, determining whether the effect of partialling it out is to (a) reduce, (b) leave unchanged, or (c) increase the correlation between college attendance and exposure to scholarship offers. Then if we simultaneously partial out only those traits whose removal tends to diminish the observed correlation we should obtain a conservative estimate of the correlation between our two primary variables when many relevant background traits are controlled. If the resulting higher-order partial correlation is still substantially greater than zero we would then have suggestive evidence for a causal relation between the variables.

Of course this argument assumes that if we were to partial out additional, relevant background traits the correlation would not be appreciably reduced. An effort was made to include in the partial correlation analysis all traits which previous studies indicated were related to one or both of our primary variables. For example, Mollenkopf and Dear (1957) have shown that the probability of exposure to a scholarship offer is related to the student's aptitude test score, sex, and to the number of scholarship applications submitted. Studies by Berdie (1954) and by the Educational Testing Service (1957) show that college-going behavior is related to father's occupational and educational level, father's income, proportion of college expenses the family is able to pay, number of friends going to college, amount of discussion about college with teachers and guidance counselors, class standing, high school curriculum, and amount of mathematics taken during high school. All of these traits were included in the analysis. Although interpretations of the results in terms of obvious alternative, rival hypotheses have been ruled out, it is conceivable that further research will suggest additional extraneous variables that need to be controlled. However, the procedure of simultaneously partialling out only traits whose removal tends to reduce the correlation should yield a *conservative* estimate of the effect of exposure to scholarship offers. Therefore it is unlikely that the observed correlation would disappear if additional traits were controlled.

Identifying Relevant Background Traits

The "decision" to enroll in college, it may be assumed, is rarely made in an all-or-none fashion at a single time or place. More likely students consider the possiblity from time to time throughout the elementary and high school years, making choices (e.g., taking or not taking a college preparatory curriculum in high school) which are in the nature of "side bets" about the future (cf. Becker, 1960). The student who decides not to take a college preparatory curriculum must realize, perhaps only dimly, that he is committing himself to a course of action in which he is betting he will not want to enroll in college. However, such bets rarely commit the individual irrevocably. He can change his mind and take the consequences, losing those side bets inconsistent with his new course of action.

Ideally, we would like to control all background traits and behaviors *antecedent to the commitment to enroll or not enroll in college and antecedent to the receipt of one or more scholarship offers*. But since commitment cannot be localized in time, and certainly not at the same stage of training for all students, there is necessarily ambiguity in saying which traits and behaviors are antecedent to the person's "final" commitment. Similarly the diversity in sources of, and administrative policies governing, scholarship offers makes it difficult to say what traits and behaviors are antecedent to his success in winning an offer of aid. For example, most colleges will offer a student aid only after he has been accepted for admission, a status which the student attains only after he has applied for admisson. On the other hand, almost half of the Certificate of Merit winners in the Merit program report that the recognition they received led to unsolicited scholarship offers (Thistlethwaite, 1961). For these students the act of applying for admission to a college was not antecedent to receiving an offer of aid from that institution. In general, we shall not consider the behavior of applying for admission to college antecedent to both events, and therefore have not included this trait in the analysis.

But what shall we say about other instrumental behaviors, such as taking the CEEB exams, and applying for loans or scholarships at a college? From one point of view, it can be said, the student will take these actions only if he plans to enter college. Yet for many students, particularly those of limited financial means, the "commitment" to enroll in college will be contingent upon receiving offers of financial assistance or perhaps of doing well on the aptitude examinations. In such cases the student's behavior is not antecedent to his "conditional" commitment though it is antecedent to his "final" commitment. For the purposes of this analysis, these behaviors have been treated as if they were antecedent to the student's final commitment and to success in receiving a scholarship offer.

All antecedent traits and behaviors on which relatively complete information was available are shown in Table 18, together with the tetrachoric correlations between the trait and each of our two primary variables. In

Table 18

Correlations Between Exposure to Scholarship offers and College Attendance when Background Traits are Partialed Out Singly

Background trait (i)	Zero-order correlations[1]		First-order partial correlations
	College attendance (r_{0i})	Exposure to offer (r_{1i})	$(r_{01\cdot i})^2$
1. Student estimates family could contribute $800 or more each year for college costs	.48	-.18	.67
2. Family's gross annual income is $5,000 or more	.30	-.26	.62
3. Not married nor planning to be married within coming year	.48	.10	.54
4. All of friends going to college	.44	.02	.54
5. Father has professional or semi-professional occupation	.35	-.05	.54
6. Mother had at least some college	.35	-.02	.53
7. Father had at least some college	.32	-.03	.53
8. Lives with both parents	.28	-.07	.53
9. Male	.24	-.05	.52
10. College preparatory course taken in high school	.40	.07	.51
11. 150 or more books in home	.23	-.01	.50

Table 18 (Cont'd)

Background trait (i)	College attendance	Exposure to offer	First-order partial correlations
12. More than 40% of high school graduating class going to college	.19	-.01	.50
13. Took the CEEB exams	.51	.14	.49
14. Encouraged "quite a lot" to go to college by high school teachers and counselors	.06	.20	.49
15. Home within commuting distance of college	.04	-.06	.49
16. Seven or more semesters of mathematics taken in high school	.31	.11	.48
17. Percentile rank in high school class of 85 or higher	.20	.46	.46
18. Applied for a loan at some college	.30	.32	.44
19. NMSQT score of 108 or higher (percentile rank of 85 or higher)	.28	.37	.44
20. Applied for two or more scholarships	.34	.49	.39

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[1] Tetrachoric correlation coefficients. The zero-order correlation between college attendance and exposure to scholarship offers was .49.

[2] The effect of controlling each trait can be estimated by comparing the first-order partial r's in this column with the zero-order r of .49 between college attendance and exposure to scholarship offers. Only traits 16-20 result in a decrease in the observed correlation.

addition, the table shows the first-order partial correlation between the latter variables, holding constant each background trait or behavior.

Of the 20 traits only five are such that the effect of their removal is to diminish the correlation of .49 between college attendance and exposure to scholarship offers. These five traits include: applied for one or more scholarships in addition to a Merit scholarship, aptitude test score equivalent to the 85th percentile or higher, percentile rank in high school graduating class of 85 or greater, applied for one or more college loans, and had seven or more semesters of mathematics in high school. These traits are all positively correlated with college attendance and with success in winning one or more scholarship offers.

Of the remaining background traits in Table 18 three had no effect upon the correlation between our primary variables when partialled out. It may be concluded that taking the CEEB examinations, living within commuting distance of college, and receiving encouragement from high school teachers and counselors to go to college are irrelevant background traits for the purposes of this analysis.

On the other hand, the effect of holding constant the remaining 12 traits is to increase the correlation between college attendance and the success in winning scholarship offers. Most notable among these is family financial resources. Students who report their families could contribute $800 or more per year for college expenses are more likely to go to college but less likely to receive scholarship offers. Thus partialling out family financial resources raises the correlation between college attendance and success in winning offers of aid to .67. By leaving these 12 background traits uncontrolled in the analysis we tend to underestimate the true correlation between independent and dependent variables.

First-order partial correlations, of course, do not take full advantage of the inter-relationships between the background traits and behaviors. It was found, for example, that father's educational and occupational level were highly related (r=.62). Thus in controlling one trait we are at the same time likely to partially control others. To partial out more than one background trait and simultaneously take account of the correlations between these traits we must turn to higher order partial correlations.

Test of the Effect of Scholarship Offers

In Table 19 we see that the correlation between college attendance and exposure to one or more scholarship offers is .36 when we hold constant the five traits whose removal tends to reduce the correlation (number of scholarship and loan applications, amount of mathematics taken in high school, aptitude test score, and rank in high school class). The standard error for this coefficient is only .01 and the partial correlation is significantly different from zero at a high level of confidence.

These results strongly suggest that there is a causal relation between receiving an offer of scholarship aid and the act of enrolling in college. The correlation method, of course, does not tell us what is cause and what is effect in this relationship. The most plausible interpretation, however, is that winning a scholarship offer made it possible for many of the examinees to continue their education. Failure to win a scholarship

Table 19

Partial Correlation Between College Enrollment and Exposure to Scholarship Opportunities Holding Five Background Traits Constant

Attribute	Zero-order correlation with college attendance (r_{oi})	Partial regression coefficients (β_{oi})
1. Received one or more scholarship offers	.49	.3999
2. Applied for two or more scholarships	.34	.0415
3. Seven or more semesters of mathematics taken in high school	.31	.2378
4. Applied for a loan at some college	.30	.1333
5. NMSQT score equivalent of 108 or higher	.28	.0476
6. Percentile rank in high school class of 85 or greater	.20	-.0381

$r_{01.23456} = +.36$

$\sigma_{r01.23456} = .01$

offer presumably caused some students to defer entry into college or to make other career plans.

Can we interpret the results equally well in terms of a reversed cause and effect relationship? Under this hypothesis one of the consequences of the student's decision to enroll in college is that he receives one or more offers of aid from scholarship donors. To be sure it is plausible to suppose that students who are firmly committed to entering college make more applications for aid, and thereby are more successful in receiving offers of assistance. We have to suppose, however, that this consequence follows even when the subjects under consideration make the same number of applications for scholarships or loans, and when they have comparable test scores, high school records, and high school training. The fact that the correlation between our primary variables remains even after we partial out differences in relevant instrumental behaviors suggests that this hypothesis cannot adequately account for the results.

Summary

To summarize, our analysis indicates that students who receive one or more scholarship offers tend to enroll in college more frequently than students who receive no offers of assistance. Further there is evidence that this correlation would remain substantial even if we were to partial out the effects of all twenty of the background traits shown in Table 18. The results cannot be attributed to extraneous differences in aptitude, high school performance, or in frequency of applying for aid. Moreover, these results do not appear explicable by supposing that success in winning offers

aid was the consequence of the decision to enroll in college. The most plausible explanation of these results is that scholarship offers cause some students to enroll in college who would not otherwise do so.

Chapter 6

SOURCES OF SCHOLARSHIP AID

We have reviewed evidence suggesting that scholarships are effective in recruiting some potential college entrants into higher education. Furthermore an analysis of reasons for talent loss between high school and college has shown that financial need consistently emerged as a primary deterrent to college attendance. In short, there are grounds for believing that institutional programs for increasing the amount of funds available for scholarship assistance can reduce talent loss.

One problem in developing a national policy of talent development which envisages scholarship aid as the primary incentive for recruiting students is to define non-competing roles that many different scholarship donors can play. New programs for increasing scholarship funds to help pay college costs will have maximum effect only if they are designed so that they do not lead to needless duplication of effort. For this reason it is important to obtain more exact information about existing sources of scholarship funds, the criteria by which scholarship granting agencies select students to receive aid, and the ways in which the student's chances of receiving various kinds of financial aid are affected by the characteristics he presents when applying for aid. The present chapter presents an analysis of the sources of scholarships held by Merit examinees during the freshman year in college. An attempt has been made to characterize the "behavior" of different donors on the basis of the kinds of students to whom scholarship donors give awards. Chapter 6 analyzes the distribution of various types of financial aid according to student characteristics.

It is, of course, hard to get exact information about current sources of scholarship funds and the criteria by which donors select students to receive aid. For one thing, there is no authoritative list of scholarship donors. Even if one were pieced together on the basis of reports of recipients only limited information could be anticipated from a survey of scholarship-granting agencies. Some donors would undoubtedly be reluctant to reveal the criteria used in making selections; others (particularly those using selection committees or panels) may not know the actual selection criteria being used. An alternative approach is to survey a sample of recipients of scholarship awards and to compare the characteristics of students receiving awards from different sources. If a much greater proportion of the recipients of awards from source A possess a given trait than the recipients of awards from source B, we can infer that the awards from source A are based on this trait more than those from source B. Of course, the value of this latter type of analysis depends upon the extent to which one's sample of recipients is representative of the nation's population of scholarship winners. Use of the present sample of Merit examinees undoubtedly leads to some biases--for example, examinees whose aptitude scores placed them between the 90th and 95th percentiles are overrepresented, as are potential college entrants from the North Atlantic region of the nation. A further difficulty is that a small proportion of Merit examinees who received scholarship awards for the freshman year of college did not know or recall the exact sources of their stipends or the nature of the restrictions as to where they could use them. Despite these limitations the data provide useful information about sources of scholarship funds, and suggest some of the selection criteria employed by different donor groups.

Sources of Scholarship Awards to Merit Examinees

Holland and Kent (1960) have recently argued that there is now an excessive concentration of scholarship funds in a small number of colleges and universities, and that this concentration permits these institutions to attract a large proportion of the supply of talented students, leaving less favored institutions and areas "intellectually denuded." Basing their analysis upon Wilkins' monograph, Financial Aid for College Students (1957), Holland and Kent report that the 50 institutions having the largest amount of undergraduate scholarship money control 34 per cent of all scholarship funds offered by colleges even though they comprise only 3 per cent of the undergraduate colleges listed by Wilkins.

It is well-known that scholarship funds controlled by colleges and universities are used almost exclusively to support attendance at the donor institution. However, since plant capacity and the number of new students who can be admitted to these relatively wealthy institutions are limited, it does not follow a relative concentration of available scholarship funds results in a similar concentration of talented scholarship winners at a few institutions. On the contrary, when we trace the sources of support received by the present sample of Merit examinees one is impressed with their extreme diversification. The nation's scholarship program, seen from the viewpoint of where money comes from to support able students, suggests that we have a "grass-roots" scholarship program in which diversity rather than concentration of control is the rule. The relevant data are presented in Tables 20-23.[1]

In Table 20 it can be seen that 54 per cent of the primary scholarship awards received by Merit examinees ranking in the top third of ability came from public or private colleges or universities. Private institutions contributed 32 per cent while public institutions contributed 22 per cent of the awards. Awards from colleges and universities are discussed in greater detail below.

State governmental agencies comprise the next largest source of scholarships (13%), while business and industrial scholarship programs ranked fourth in the percentage of awards made to Merit examinees (7%). Contributions from business and industry are probably underestimated since some scholarship funds from these sources are administered through colleges or scholarship foundations.

Although a third of the scholarships received by this group of talented students came from private colleges and universities no single institution contributed a very large proportion of the awards. Among private institutions Duke University contributed the largest proportion of awards (Table 21). However, this institution gave less than one half of one per cent of the total number of awards. Similarly, even if we

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[1] Students who received more than one scholarship have been classified with respect to the source contributing the largest stipend. Students for whom it was impossible to identify the primary source are listed under "unidentified sources" in Table 20.

Table 20

Source of Primary Scholarship Award Received for Freshman Year by 6,978 Students Ranking in the Top Third Relative to the National Distribution of Ability

Source (Scholarship Donor)	Number and per cent of awards: N	Number and per cent of awards: Per Cent	Median value of award in dollars
1. Public Control	2659	39	$238
Public colleges and universities (314 institutions)	1515	22	$208
State governmental agencies (43 states)	913	13	$281
Federal governmental agencies (NROTC, military service academies)	202	3	more than $1000
County or municipal governmental agencies	29	.4	$244
2. Private Control	3938	56	$324
Private colleges and universities (619 institutions)	2266	32	$366
Business and industry (General motors, Jr. Achievement, unions, and local businesses)	491	7	$458
High school groups (PTA, faculty student, alumni groups, boards of education, etc.)	320	5	$180
Community organizations (Kiwanis, Rotary, Lions clubs, women's clubs, etc.)	186	3	$207
Scholarship foundations (National Merit Scholarship Corp., Alfred P. Sloane Foundation, etc.)	148	2	$557
Church and religious organizations	130	2	$293
Fraternal groups (Elks, Knights of Columbus, Panhellenic, etc.)	87	1	$209
Memorial Scholarships and trust funds	80	1	$390
Professional associations (medical, nursing, engineering, teachers associations)	78	1	$202
Other unclassified private donors	152	2	$223
3. Unidentified Sources	381	5	
TOTALS	6,978	100	

consider all 17 of the private colleges and universities making the largest number of awards, we find that collectively they made less than 5 per cent of all awards to Merit examinees.

Table 22 shows the number and percentage of scholarship awards contributed by publicly-controlled universities. Michigan State University was the largest contributor, though it gave less than one per cent of the total number of awards. As a whole, the 15 largest contributors among public universities gave only about 6 per cent of all the awards given to Merit examinees.

The single largest contributor of scholarships to this group of Merit examinees was not a public or private university but the New York State scholarship system. Table 23 summarizes the proportions of awards received from the 12 states contributing the greatest number of awards. Of the freshman scholarships received by Merit examinees 3.4 per cent came from the scholarship program of the state of New York. Collectively the 12 states listed in Table 23 contributed about 11 per cent of all the awards. It is also clear from the last column of this table that these states accounted for a disproportionately large share of all state scholarship funds: although these states produced somewhat less than half of the secondary school graduates of the nation they contribute over 80 per cent of all the scholarships given by state governmental agencies.

These results suggest that the freshman scholarships actually awarded to talented students each year come from a great variety of sources.

Table 21

Scholarships Received from 619 Private Colleges and Universities

		Per cent relative to	
Colleges	N	awards from private institutions	all awards received by Merit examinees (N=6,978)
Duke University	33	1.46	.47
Brigham Young University	29	1.28	.42
Yale University	26	1.15	.37
Stanford University	24	1.06	.34
Northwestern University	22	.97	.32
University of Pittsburg	22	.97	.32
Vanderbilt University	20	.88	.29
Emory University	18	.79	.26
University of Chicago	18	.79	.26
Valparaiso University	18	.79	.26
Harvard University	18	.79	.26
University of Pennsylvania	18	.79	.26
Mass. Institute of Technology	17	.75	.24
Tuland University	17	.75	.24
Dartmouth	16	.71	.23
Cornell University	16	.71	.23
Princeton University	15	.66	.21
Colleges offering less than 15 awards	1919	84.70	27.50
TOTALS	2266	100.00	32.48

Table 22

Scholarships Received from 314 Public Colleges and Universities

Colleges	N	Per cent relative to awards from public institutions	Per cent relative to all awards received by Merit examinees (N=6,978)
Michigan State University	45	2.97	.64
University of Wisconsin	43	2.83	.62
Louisiana State University	31	2.05	.44
University of Michigan	32	2.11	.46
Indiana University	29	1.91	.42
University of Kansas	28	1.85	.40
University of Nebraska	30	1.98	.43
Ohio State University	28	1.85	.40
University of Utah	28	1.85	.40
University of North Carolina (Chapel Hill)	26	1.72	.37
Purdue University	26	1.72	.37
University of Minnesota	23	1.52	.33
University of Texas	23	1.52	.33
State University of Iowa	22	1.45	.32
University of Alabama	22	1.45	.32
Colleges offering less than 20 awards	1079	71.22	15.46
TOTALS	1515	100.00	21.71

Table 23

Scholarships Received from State Governmental Agencies

State	N	Per cent relative to		Per cent of 1959 public secondary school graduates from each state*
		awards from state governmental agencies	all awards received by Merit examinees (N=6,978)	
New York	237	25.95	3.40	7.92
Illinois	170	18.62	2.44	5.03
California	73	8.00	1.05	8.96
Pennsylvania	55	6.02	.79	6.38
Louisiana	50	5.48	.72	1.65
Wisconsin	29	3.18	.42	2.75
Indiana	27	2.96	.39	2.97
Michigan	27	2.96	.39	4.46
New Jersey	24	2.63	.34	2.87
Colorado	22	2.41	.32	.99
Massachusetts	20	2.19	.29	2.75
Texas	20	2.19	.29	4.98
Other states	159	17.41	2.28	48.29
TOTALS	913	100.00	13.12	100.00

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*Figures are based upon 50 states and D.C., from which there were an estimated 1,456,737 graduates from public secondary schools in 1959.

No single donor contributes more than about three per cent of the awards to students ranking in the upper third of ability. Moreover, the single donor making the largest number of awards to these students (the New York State scholarship system) is one which grants the recipient considerable freedom in selecting his college. In short, we find considerably less evidence for the concentration of scholarship awards than the analysis of Holland and Kent (1960) suggests. In a recent study of College Board institutions, Natalie Rogoff (1957) reports that there are nine colleges "where there are at least seven times as many applicants as available places, and which could, theoretically fill their freshman class three three times over without going below the median aptitude (of applicants)." One interpretation of these findings is that while the potential scholarship funds available for supporting the higher education of talented students are relatively concentrated in selected colleges and universities, the extent to which this economic power can be used to achieve a "monopoly" with respect to able students is quite limited.

Freedom of Choice Permitted Recipient

Despite the fractionation of control apparent in the nation's annual freshman scholarship awards, there are some uniformities worth noting in the administration of these awards. For example, if we ask each recipient of a freshman scholarship where he was free to use his stipend we find that 68 per cent of the awards were contingent upon enrolling at a particular college. Only 16 per cent of these students were free to use their awards at any college of their choice. Table 24 shows that private and public colleges are most restrictive in the extent to which they require recipients to enroll at a particular institution. (Presumably all awards from these institutions would be restrictive were it not for privileges given to children of faculty at institutions having scholarship exchange agreements with other institutions.) In contrast, scholarship awards received from state and federal governmental agencies typically permit the recipient relatively great latitude in selecting his college.

These results are consistent with the assumption that public and private colleges offer aid primarily to the student who has taken the instrumental step of applying for admission. To be sure, there are a few institutions which make unsolicited scholarship offers to near-winners in national scholarship competions, but there are probably not more than a dozen higher educational institutions which follow this practice. Since colleges and universities collectively control more than half of the nation's scholarship resources it follows that a good share of the nation's scholarship resources are used to support students who are already at least provisionally planning to enter college. But what of students who do not take the instrumental step of applying for admission to a particular college? Presumably many talented student unfamiliar with college scholarship opportunities, or uncertain about their chances of securing aid, fail to apply for admission and consequently are never considered for these scholarships. In short, a relatively small proportion of the nation's scholarship resources are now being used to recruit into higher education talented high school graduates who are undecided about entering college.

Table 24

Donors and Freedom of Choice of College Permitted Recipients of Single Scholarship Awards

Source of single scholarship held by student	N*	Per cent of awards from donor permitting a given degree of freedom in choice of institution†		
		No freedom	Partial freedom	Complete freedom
1. Public Control	2442	64	32	4
Public colleges and universities	1410	94	5	1
State governmental agencies	822	20	76	4
Federal governmental agencies	184	29	52	19
County or municipal government	26	42	12	46
2. Private Control	3599	70	6	24
Private colleges and universities	2084	98	1	1
Business and industry	429	39	12	49
High school groups	304	14	8	78
Community organizations	172	27	12	61
Scholarship foundations	134	26	10	64
Church and religious organizations	116	55	26	19
Professional associations	74	18	24	58
Memorial scholarships and trust funds	72	39	18	43
Fraternal groups	72	18	11	71
Other unclassified private donors	142	16	9	75

*N's do not correspond to those in the preceding table because students receiving more than one award or not stating restrictions on choice of institution have been excluded.

†Variations in freedom of choice for recipient were defined as follows: no freedom--had to go to a particular college; partial freedom--could go anywhere in state or to any on an approved list; complete freedom--could go to any college of choice.

Selection Baises in Awards from Different Sources

In this section we shall consider how scholarship-granting agencies differ with respect to the criteria by which they select students to receive scholarship aid. Other selection biases which may be said to collectively characterize scholarship donors are considered in Chapter 6.

The reader is cautioned not to infer specific selection criteria from these data. The analysis does not permit us to distinguish what is cause and what is effect in the relationships described. For example, a particular scholarship-granting agency may give an unusually high proportion of its awards to students planning to major in the physical sciences and to students with very high aptitude test scores. However, since the physical sciences tend to attract unusually talented students, as we shall show in a later chapter, it cannot be inferred whether the donor actually selected students on the basis of study plans, test scores, some combination of the two, or perhaps on the basis of some other criterion correlated with both. The following tables, therefore, present a description of selection baises; they do not necessarily identify the specific selection policies which account for observed differences among recipients.

Aptitude Selectivity. Table 25 shows that privately controlled scholarship foundations (National Merit Scholarship Corporation, Alfred P. Sloane Foundation, and similar agencies) are most selective with respect to aptitude, giving about three-fourths of their awards to students in the top decile of ability. Ranking second and third in order of selectivity with respect to aptitude test scores were county (or municipal) governmental agencies and federal governmental agencies, respectively.

It is also clear the two largest sources of scholarships--private and public colleges and universities--place considerable weight upon aptitude scores in making their selections. Fifty-eight per cent of the scholarships from private colleges went to students ranking in the top decile, while 45 per cent of the scholarships from public colleges went to students scoring in the top decile.

The least selective sources with respect to aptitude test scores were high school groups, church and religious organizations, and community organizations (Rotary, Lions clubs, etc.). These groups, which contributed about 10 per cent of all the awards to Merit examinees, gave slightly less than 40 per cent of their awards to students ranking in the top decile of ability.

Probable major field of study. Almost a third of the scholarship awards to Merit examinees went to students planning to major in one of the physical sciences, (chemistry, engineering, geology, mathematics, or physics). Sources are therefore ordered in Table 26 with respect to the percentage of each donor's awards given to students planning to major in one of these fields. As expected, donors giving larger proportions of their awards to physical science majors tend to be the donors most selective with respect to aptitude test scores. Among the 14 donor groups, there is a rank order correlation of .67 between the percentage of awards given to probable physical science majors (Table 26) and the percentage of awards given to examinees ranking in the top decile of ability (Table 25). Expressing this relationship in another way, the seven agencies giving the greatest proportions of their awards to physical

Table 25

Aptitude Test Scores of Recipients of Scholarships From Different Sources

Source of primary scholarship held by student (Sources ordered by percentage of awards to Ss in top decile)	N	Percent with National Merit Scholarship Qualifying Test Scores in given percentile rank intervals relative to national norms				Total per cent
		64-69	70-79	80-89	90-99+	
1. Public Control	2659	8	16	25	51	100
County or municipal government	29	7	10	17	66	100
Federal governmental agencies	202	6	10	20	64	100
State governmental agencies	913	8	14	21	57	100
Public colleges and universities	1515	9	18	28	45	100
2. Private Control	3938	8	16	22	54	100
Scholarship foundations	148	5	9	10	76	100
Private colleges and universities	2266	7	14	21	58	100
Business and industry	491	9	14	23	54	100
Fraternal groups	87	6	36	11	47	100
Professional associations	78	6	18	30	46	100
Memorial scholarships and trust funds	80	11	16	29	44	100
Community organizations	186	12	19	29	40	100
Other unclassified private donors	152	15	17	28	40	100
Church and religious organizations	130	12	22	28	38	100
High school groups	320	11	20	32	37	100

science majors are also the seven agencies ranking highest in the proportions of awards given to students in the top decile of ability.[2]

Most of the scholarships from federal governmental agencies--the source giving the greatest percentage (58.4) of awards to physical science majors--consisted of grants under the Naval ROTC program and of appointments to one of the military service academies. Presumably the selection bias reflected in these awards was more influenced by the student's potential interest in a military career than by his plans to enter one of the physcial sciences. However, regardless of the specific selection decisions which produced the distributions shown in Table 26, it is apparent that scholarship awards from federal governmental agencies, business and industry, and from scholarship foundations go primarily to physical science majors. Moreover, awards from these sources tend to carry the highest stipends (Table 20).

Family financial resources. Do donors differ in the extent to which their scholarship awards tend to go to students from low-income families? Table 27 suggests that they do. Forty per cent or more of the awards from publicly-controlled colleges and universities, community organizations, and high school groups go to students whose families can afford to pay no more than $300 per year for college costs. In contrast, only about a fourth of the awards from privately-controlled colleges and universities, scholarship foundations, and federal govern-

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[2] In chapter 9 an analysis has been made of whether students planning to enter certain fields of study are subsidized more often than we would expect on the basis of their relative aptitudes and instrumental behaviors in seeking aid.

Table 26

Probable Major Field of Study and Source of Primary Scholarship Held by Student

Source of Primary scholarship (sources ordered by percentage majoring in physical sciences)	No. of students	Per cent of students reporting given field as their probable major field of study					
		Phys. sci.	Soc. Sci.	Arts & Hum.	Biol. Sci.	Business	Other Fields*
Public Control	2,659	36.6	19.8	12.6	8.7	4.2	18.1
Federal governmental agencies	202	58.4	10.9	3.5	4.5	3.5	19.2
County or municipal agencies	29	41.4	24.2	3.4	10.4	3.4	17.2
State governmental agencies	913	35.5	24.7	13.5	10.6	2.0	13.7
Public colleges and universities	1,515	34.3	18.0	13.5	8.1	5.5	20.6
Private Control	3,938	30.3	23.1	15.1	10.1	3.7	17.7
Business and industry	491	46.2	16.1	6.5	7.5	5.1	18.6
NMSC and other sch. founds.	148	40.5	8.1	14.8	10.1	5.4	21.1
Memorial scholarships and trust funds	80	40.0	15.0	10.0	13.7	---	21.3
Community organizations	186	30.7	24.7	13.5	7.5	3.2	20.4
Private colleges and universities	2,266	29.0	23.2	17.0	11.4	3.1	16.3
Other unclassified private donors	152	25.7	24.3	13.2	10.5	3.9	22.4
High school groups	320	22.5	35.0	14.7	7.2	5.6	15.0
Professional associations	78	21.9	32.1	14.1	7.7	3.8	20.4
Church and religious organizations	130	16.2	25.4	21.5	6.2	3.8	26.9
Fraternal groups	87	11.5	32.2	17.2	10.3	5.7	23.1
TOTALS	6,597	32.8	21.8	14.1	9.5	3.9	17.9
Study plans of students not holding scholarships	14,800	27.6	22.0	13.1	10.2	6.3	20.8

*Includes students who are undecided, did not specify a field of study, and who named fields not classifiable (e.g., split majors).

mental agencies go to students from such families. Part of the difference between public and private colleges and universities can be attributed to the kinds of students applying for aid at these institutions. Low-income students are presumably discouraged from applying for admission at private colleges where college costs tend to be greater. The fact that 47 per cent of the awards from scholarship foundations, and 42 per cent of those from federal governmental agencies go to relatively well-to-do students suggests that scholarships from these sources are often used to support students who are likely to be college-bound in any case. In other words, scholarship funds currently administered by privately-controlled colleges, scholarship foundations, and federal governmental agencies will frequently influence where the talented student attends college; they will less frequently influence whether he attends college.

Financial need. Scholarship-granting agencies sometimes select recipients, or fix stipend amounts, on the basis of a "need" formula which roughly makes a student's estimated financial need proportionate to the difference between the costs of attending the college selected and the ability of his family to pay these costs. Thus it is possible that two students whose families can contribute identical amounts to pay college costs will have quite different estimated needs, particularly if they select colleges which differ markedly in tuition costs and living expenses. For this reason it is difficult to interpret data on the proportion of each donor's awards given to students with relatively great financial need. A particular agency may give 60 per cent of its awards to students having need estimates of $1,000 or more per year. However,

Table 27

Estimated Family Financial Resources and Source of Primary Scholarship Held

		Percent of recipients in each resource group		
		Amount of money per year student estimates family could contribute to pay college costs		
Source of primary scholarship held	No*	$300 or less	$400-$700	$800 or more
1. Public Control	2,560	37	33	30
Public colleges and universities	1,460	40	34	26
State governmental agencies	877	37	30	33
Federal governmental agencies	194	26	32	42
County or municipal agencies	29	28	45	27
2. Private Control	3,810	31	30	39
Private colleges and universities	2,185	26	31	43
Business and industry	474	37	32	31
High school groups	314	40	29	31
Community organizations	179	46	28	26
Scholarship foundations	144	27	26	47
Church and religious organizations	128	31	30	39
Fraternal groups	83	38	27	35
Memorial scholarships and trust funds	78	38	35	27
Professional associations	75	36	33	31
Other unclassified private donors	150	39	30	31
3. Unidentified sources	368	45	32	23
Totals	6,738	34	31	35

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* Includes only recipients who provided estimates of family financial resources.

this relatively high proportion of awards to "high need" cases might simply reflect the fact that recipients of awards from this donor tend to select high-cost colleges. Thus we would expect privately-controlled colleges to give greater proportions of their awards to students with relatively "high" need estimates than do publicly-controlled colleges. Such a prediction might follow simply from the differences in the costs of attending private and public colleges. For these reasons no attempt has been made to compare donors with respect to the proportions of awards made to students with given financial need estimates. A more meaningful comparison consists in relating the sizes of stipends awarded to such need estimates. If the donor's stipends vary systematically with the recipients' estimated financial needs it is clear that the need formula has been used at least in fixing stipends.

Current estimates of tuition costs and living expenses were available for 429 of the colleges attended by Merit examinees holding scholarships. Approximate estimates of need were calculated by the difference between these costs and the amount of money each recipient reported his family could contribute per year toward college costs.

Table 28 shows how the stipends awarded by selected donors varied with these estimates of financial need. Considering the two largest sources of scholarship awards--private and public colleges or universities--it is clear that privately-controlled colleges use the need formula in determining stipends to a much greater degree than do publicly-controlled institutions. Awards from scholarship foundations,

Table 28

Financial Need Estimates and the Size of Freshman Stipend Received from Different Donor Groups

Source of primary scholarship held	Number of students for whom need estimates were made	Median value of Freshman scholarship in dollars for students with different financial needs* Financial need estimate: 0 - $249	$250- $499	$500- $749	$750- $1,000	More than $1,000
1. Public control						
Private colleges and universities	761	200	208	241	223	263
State governmental agencies	350	165	144	243	217	350
Federal governmental agencies	106	More than 1,000	---	950	912	More than 1,000
2. Private control						
Private colleges and universities	1068	256	215	266	347	676
Business and industry	225	291	490	400	410	770
High school groups	114	150	230	208	212	175
Community organizations	72	207	---	---	237	200
Scholarship foundations	87	275	---	---	512	More than 1,000
Church and religious organizations	57	---	140	---	458	400

*Median values are reported only for subgroups having at least 10 awards.

however, show the greatest systematic variation with financial need. It may be noted that the National Merit Scholarship Corporation, which follows the practice of making its stipends proportionate to financial need, contributed most of the awards received from scholarship foundations. Thus the analysis corroborates the known policy of fixing stipend amounts in this instance.

Summary and implications

The foregoing results suggest that the control of existing scholarship resources lies in many hands rather than in a few. No single scholarship-granting agency controlled more than about three per cent of the scholarships given to Merit examinees ranking in the top third of ability. Diversification of the control of scholarship resources has several implications for the development of a national policy of talent development. For one thing it means that independent scholarship-granting agencies are likely to compete against each other in offers of support to low-risk candidates. Since candidates with extremely high college aptitude test scores represent cases for which the risks of supporting unqualified students are least, it seems likely that the actions of many independent agencies often leads to excessive proselyting among students in the top decile of ability, while insufficient attention is given to recruiting qualified students with slightly lower aptitude scores. Consistent with this conjecture is the finding that more than half of the scholarships awarded to Merit examinees went to students ranking in the top decile of ability.

A second consequence of diversified control of scholarship funds is that it is difficult to use such funds to maximize their effectiveness in reducing talent loss. Even though a large proportion of the existing scholarship-granting agencies might endorse the desirability of using such scholarships whenever possible to recruit uncommitted talent into higher education, there are limits to which donors can implement this policy. Thus colleges and universities are frequently under pressures to improve their talent supplies, and will support applicants for aid even though it is obvious that many of the recipients will attend some college regardless of whether or not they receive aid. We have seen that two-thirds of the scholarships won by talented Merit examinees could be used only at a particular college or university. It seems fair to conclude that a large proportion of the nation's scholarships are administered under conditions in which the objective of reducing talent loss may be compromised by other, over-riding objectives of the donor.

A federal scholarship program could indeed be designed so that scholarships are more frequently used to offer support to talented students for whom winning or not winning aid will be crucial in determing whether the student continues his education. Of course it is desirable that such a program be instituted so that it does not unduely discourage private scholarship-giving. Undoubtedly the initiation of a federal scholarship program would result in the loss of some of the existing publicly- and privately-controlled scholarship programs. However, it seems likely that the largest single source of scholarship--private colleges and universities--would continue to provide scholarship support as a means of achieving more favorable talent supplies. We have seen that presently only about a third of the scholarships given to talented Merit examinees went to students who estimated their families could contribute $300 or less per year for college costs. By designing new programs of scholarship support so that they are aimed primarily at groups inadequately supported by existing scholarship agencies it should be possible to define noncompeting roles for both public and private donors.

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the student's chances of obtaining various kinds of support. Second, in considering new proposals for reducing talent loss it is desirable that we know something about the extent to which talented college students are currently supported by different kinds of aid programs. We have already seen in Chapter 4 that Merit examinees who did not enroll in college rarely applied for federal loans, although over half said they would be willing to apply for a federal loan under certain conditions. By studying the extent to which students enrolling in college utilize loan opportunities we may obtain additional information about their usefulness as a means of reducing talent loss. Finally, these data are useful in identifying groups of students who are least adequately supported by existing financial aid programs. Thus such data may suggest functions for new aid programs that do not overlap excessively with functions now served by existing scholarship-granting agencies.

Traits Related to the Probability of Receiving Scholarship Offers

Before considering characteristics of recipients of financial aid it is important to remind ourselves of the major factors determining the likelihood that a high school senior will receive a scholarship offer.

Chapter 7

CHARACTERISTICS OF RECIPIENTS OF FINANCIAL AID

How are scholarships, loans, and part-time jobs distributed among beginning college students? Answers to this question are needed for several reasons. First, high school counselors, parents, and students are often interested in assessing the probability of obtaining financial aid to pay college costs. Information about the distribution of financial aid to undergraduates may provide a more realistic basis for determining the student's chances of obtaining various kinds of support. Second, in considering new proposals for reducing talent loss it is desirable that we know something about the extent to which talented college students are currently supported by different kinds of aid programs. We have already seen in Chapter 4 that Merit examinees who did not enroll in college rarely applied for federal loans, although over half said they would be willing to apply for a federal loan under certain conditions. By studying the extent to which students enrolling in college utilize loan opportunities we may obtain additional information about their usefulness as a means of reducing talent loss. Finally, these data are useful in identifying groups of students who are least adequately supported by existing financial aid programs. Thus such data may suggest functions for new aid programs that do not overlap excessively with functions new served by existing scholarship-granting agencies.

Traits Related to the Probability of Receiving Scholarship Offers

Before considering characteristics of recipients of financial aid it is important to remind ourselves of the major factors determining the likelihood that a high school senior will receive a scholarship offer.

In chapter 5 relationships between 20 student background traits and success in receiving scholarship offers were summarized. We have seen in Table 18 that the three traits having the highest correlations with success were number of scholarship applications made (.49), percentile rank in high school class (.46), and aptitude test score (.32). Since the sample of examinees was selected on the basis of test scores the later correlation is attenuated, and the data should not be interpreted as indicating that test scores of unselected students are poorer predictors of success than numbers of applications or high school ranks.

Nonetheless it is apparent that self-selection plays a major role in determining whether or not the high school student is exposed to a scholarship offer. Among examinees making only one scholarship application (i.e., merely applying to the National Merit Scholarship Corporation by participating in the initial testing session) 12.7 per cent received one or more scholarship offers.[1] But among examinees making two applications the percentage who were successful rose to 45 per cent, and among those making 7 or more applications 94 per cent received one or more offers of scholarship aid. Figure 5 shows the systematic increase in probability of exposure to an offer with increasing number of applications.

Similar results have been reported by Mollenkopf and Dear (1957) and Thistlethwaite (1959c). At least as long as high school seniors con-

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[1] Since Merit Scholarships were offered to only about one fourth of one per cent of the estimated 299,529 eligible examinees having NMSQT scores of 88 or higher, the majority of these offers came from other sources. Presumably they came from high school groups, community organizations, and similar agencies which do not require recipients to submit applications.

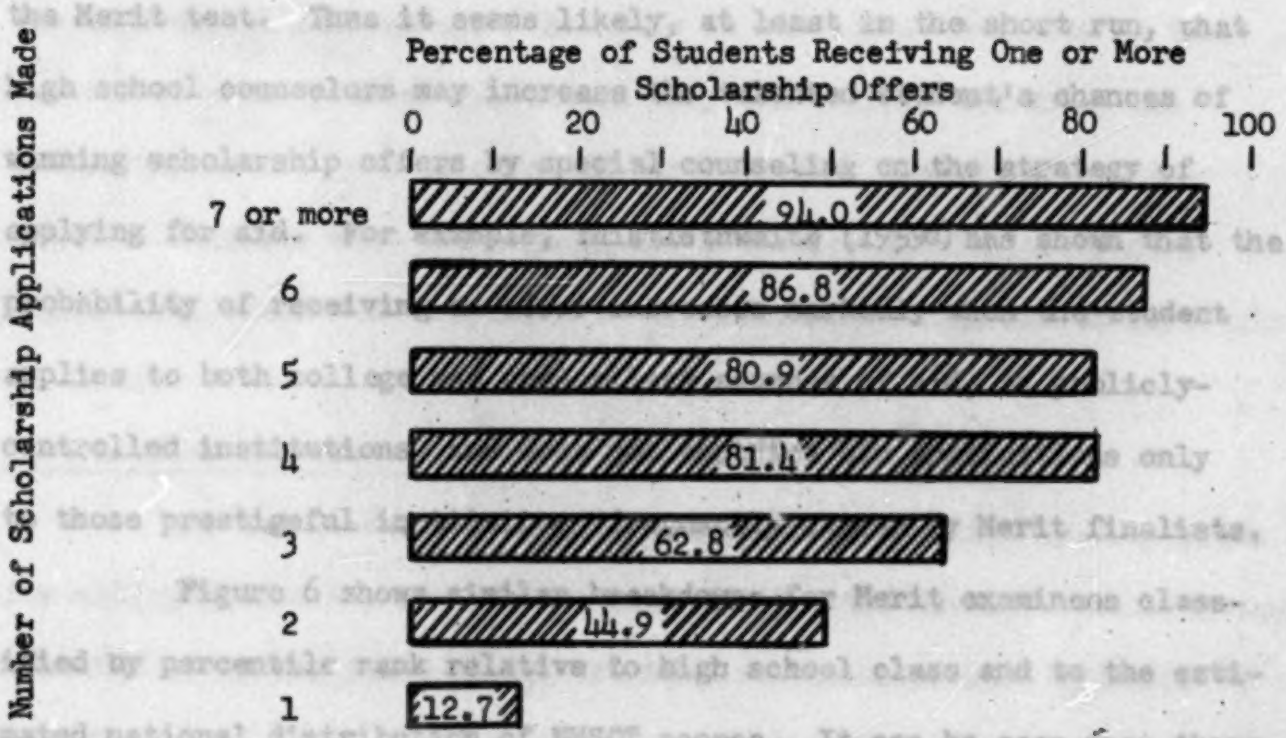

Figure 5. Number of Scholarship Applications As a Predictor of the Probability of Receiving Scholarship Offers

tinue to apply for aid with about the same frequency as they presently do, we can say that the student's initiative and persistence in seeking aid will be a major determinant of his success in receiving a scholarship offer. Approximately 40 per cent of the examinees ranking in the top third of ability made no application for scholarship aid beyond taking the Merit test. Thus it seems likely, at least in the short run, that high school counselors may increase the talented student's chances of winning scholarship offers by special counseling on the strategy of applying for aid. For example, Thistlethwaite (1959c) has shown that the probability of receiving an offer increases markedly when the student applies to both college and non-college sources of aid, to publicly-controlled institutions, and does not restrict his applications only to those prestigeful institutions frequently chosen by Merit finalists.

Figure 6 shows similar breakdowns for Merit examinees classified by percentile rank relative to high school class and to the estimated national distribution of NMSQT scores. It can be seen that there is a systematic increase in the proportion receiving scholarship offers with increases in both types of ranks. It should be noted that the foregoing results were obtained among a random sample of 5,083 eligible examinees responding to the Fall, 1959 survey (cf. footnote, Table 17), and are descriptive of what has previously been called the population of *potential* college entrants. Similar results are obtained, however, when we examine the probability of receiving a scholarship offer among college entrants. The chief difference is that the likelihood of success is slightly greater among college entrants. About 41 per cent of the latter received one or more scholarship offers, whereas 37 per cent of the potential college entrants received at least one offer. Among college entrants classified by percentile ranks as in Figure 6, the percentages receiving at least one offer varied for the lowest- and highest-ranking groups from 26.2 to 66.2 for test score groups, and from 13.6 to 69.1 for high school rank groups. Although in subsequent analyses in this chapter we shall present breakdowns only for college entrants, the similarity in the results obtained for potential and actual college entrants suggests that the high school counselor wishing to counsel high school seniors on the basis of the later data will not be seriously in error.

Distribution of Financial Aid to First-Year College Students

Of the incentives available for recruiting high-ability youth for college, scholarships are the most widely used device. Table 29 shows that the estimated value of all freshman scholarships held by Merit examinees in the top third of ability exceeded 30 million dollars, while the value of all federal loans held by these students was only about four million dollars. Assistance received in the form of scholarships was thus about seven and a half times the value of assistance received in the form of federal loans. Part-time jobs ranked second in importance as a source of financial aid for these college students; the total value of aid students expected to receive from such jobs during the freshman year was almost 22 million dollars.[2]

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[2] Estimates of stipends for part-time jobs are probably somewhat overestimated since students reported at the start of the school year what they expected to earn. Presumably many of these students will find that they have overestimated the amount of time they can spend each week on part-time jobs.

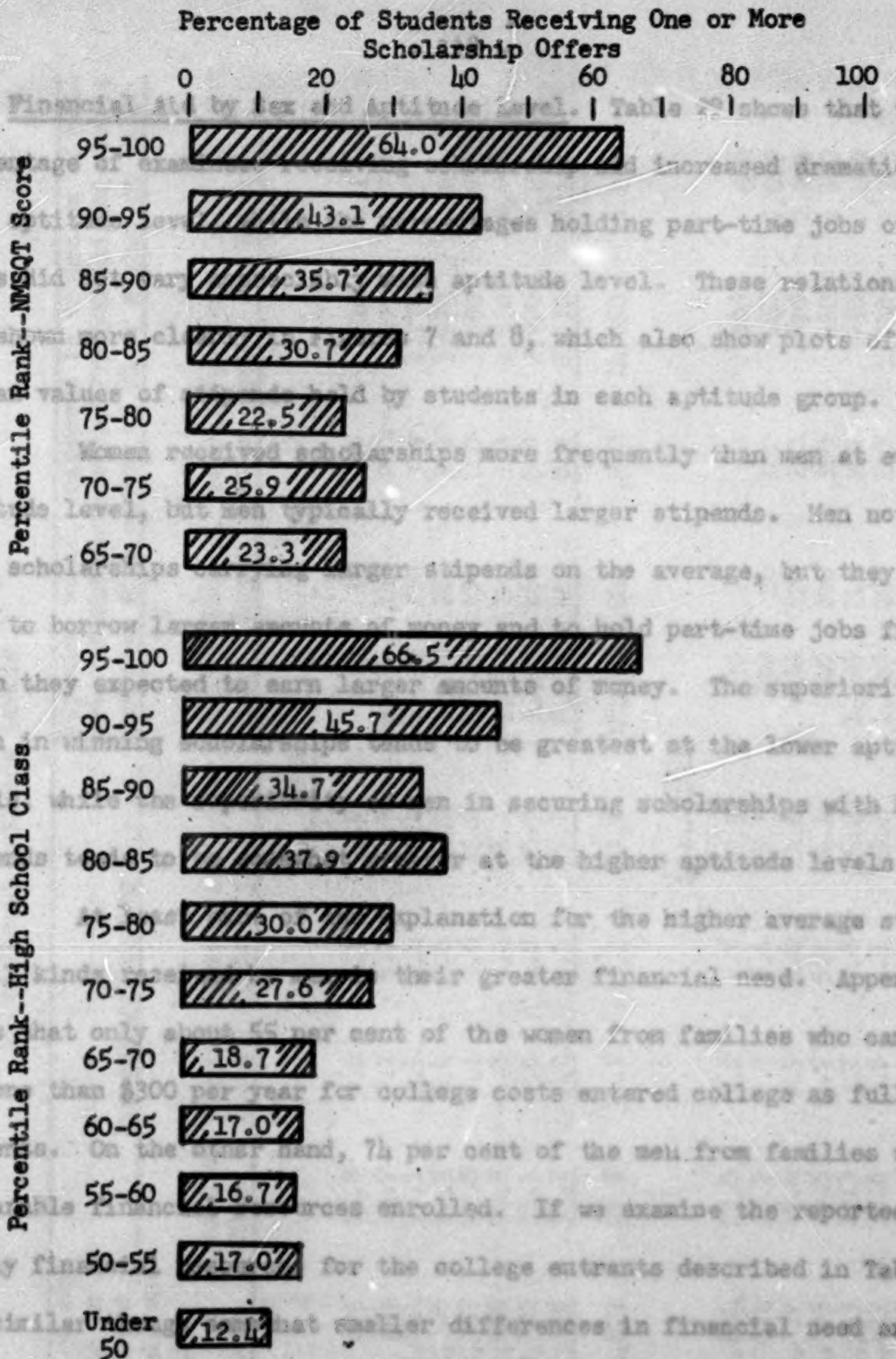


Figure 6. Aptitude Test Score and High School Rank As Predictors of the Probability of Receiving Scholarship Offers.

Financial Aid by Sex and Aptitude Level. Table 29 shows that the percentage of examinees receiving scholarship aid increased dramatically with aptitude level, while the percentages holding part-time jobs or loans did not vary appreciably with aptitude level. These relationships are shown more clearly in Figures 7 and 8, which also show plots of the median values of stipends held by students in each aptitude group.

Women received scholarships more frequently than men at every aptitude level, but men typically received larger stipends. Men not only hold scholarships carrying larger stipends on the average, but they also tend to borrow larger amounts of money and to hold part-time jobs from which they expected to earn larger amounts of money. The superiority of women in winning scholarships tends to be greatest at the lower aptitude levels, while the superiority of men in securing scholarships with high stipends tends to be somewhat greater at the higher aptitude levels.

At least part of the explanation for the higher average stipends of all kinds received by men is their greater financial need. Appendix B shows that only about 55 per cent of the women from families who can pay no more than $300 per year for college costs entered college as full-time students. On the other hand, 74 per cent of the men from families with comparable financial resources enrolled. If we examine the reported family financial resources for the college entrants described in Table 29, similar though somewhat smaller differences in financial need are apparent. Fifty-three per cent of the men, as compared with 48 per cent of the women enrolling in college said their families could give them no more than $700 per year for college costs.

Table 29

Financial Aid Received by First-Year College Students in Different Aptitude Levels

Aptitude Level (equivalent percentile rank)	No. of students in analyzed sample enrolling in college	Percentage holding				Projected value, expressed in thousands of dollars, of aid received by 299,500 eligible Merit examinees with scores of 88 or higher on NMSQT				
		Scholarships	Federal loans	Non-federal loans	Part-time jobs	Scholarships	Federal loans	Non-federal loans	Part-time jobs	Total
I. BOYS										
64 - 65	475	15.8	3.4	5.1	34.9	260	70	130	710	1,170
66 - 68	803	13.9	3.1	5.1	33.7	370	140	200	1,070	1,780
70 - 74	1,444	19.1	3.1	4.4	30.4	1,190	210	310	1,770	3,480
75 - 79	1,366	19.5	3.4	5.6	33.9	1,110	280	370	1,930	3,690
80 - 84	1,387	21.8	3.1	5.6	32.9	1,420	230	400	1,880	3,930
85 - 90	1,626	28.8	4.3	5.0	31.1	2,160	390	380	1,970	4,900
90 - 95	2,322	33.1	3.6	4.8	30.9	3,890	460	540	2,990	7,880
95 +	2,398	52.2	3.4	5.5	25.2	8,030	460	640	2,330	11,460
	11,821	29.8	3.5	5.1	30.6	18,430	2,240	2,970	14,650	38,290
II. GIRLS										
64 - 65	404	23.0	3.2	4.5	27.5	230	70	90	300	690
66 - 68	674	23.7	2.7	5.6	24.5	390	80	160	440	1,070
70 - 74	1,259	25.4	3.9	4.8	24.4	930	220	250.	890	2,290
75 - 79	1,335	26.5	3.7	5.2	24.1	940	260	300	920	2,420
80 - 84	1,313	29.3	3.7	5.0	25.2	1,010	240	280	950	2,480
85 - 90	1,419	34.8	3.5	4.1	25.6	1,540	260	260	1,090	3,150
90 - 95	1,936	41.5	4.0	4.9	25.9	2,760	420	400	1,450	5,030
95 +	1,617	52.3	3.3	5.0	22.3	4,160	280	390	1,030	5,860
	9,957	34.7	3.6	4.9	24.7	11,960	1,830	2,130	7,070	22,990
TOTALS	21,778	32.0	3.5	5.0	27.9	30,390	4,070	5,100	21,720	61,280

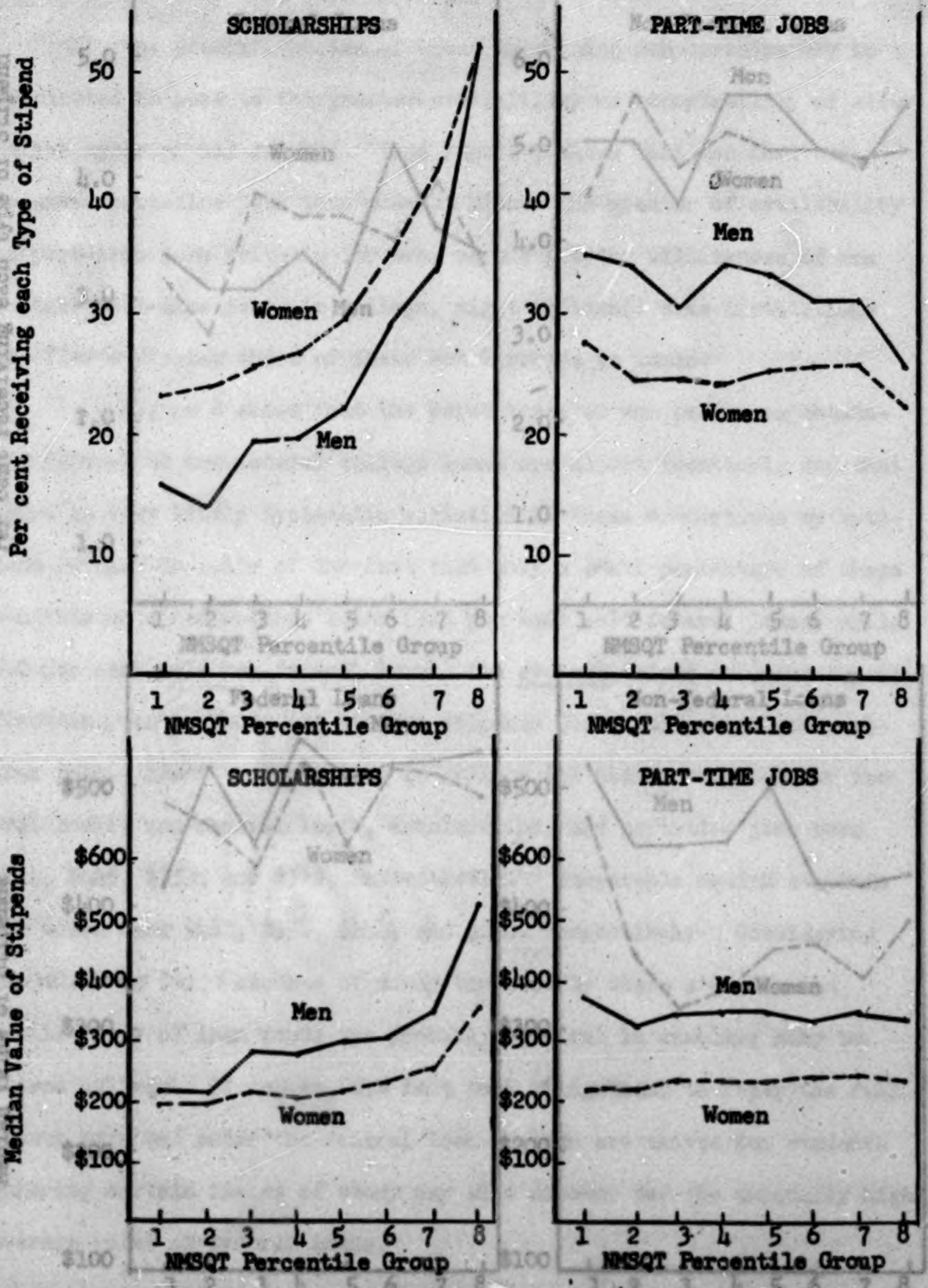
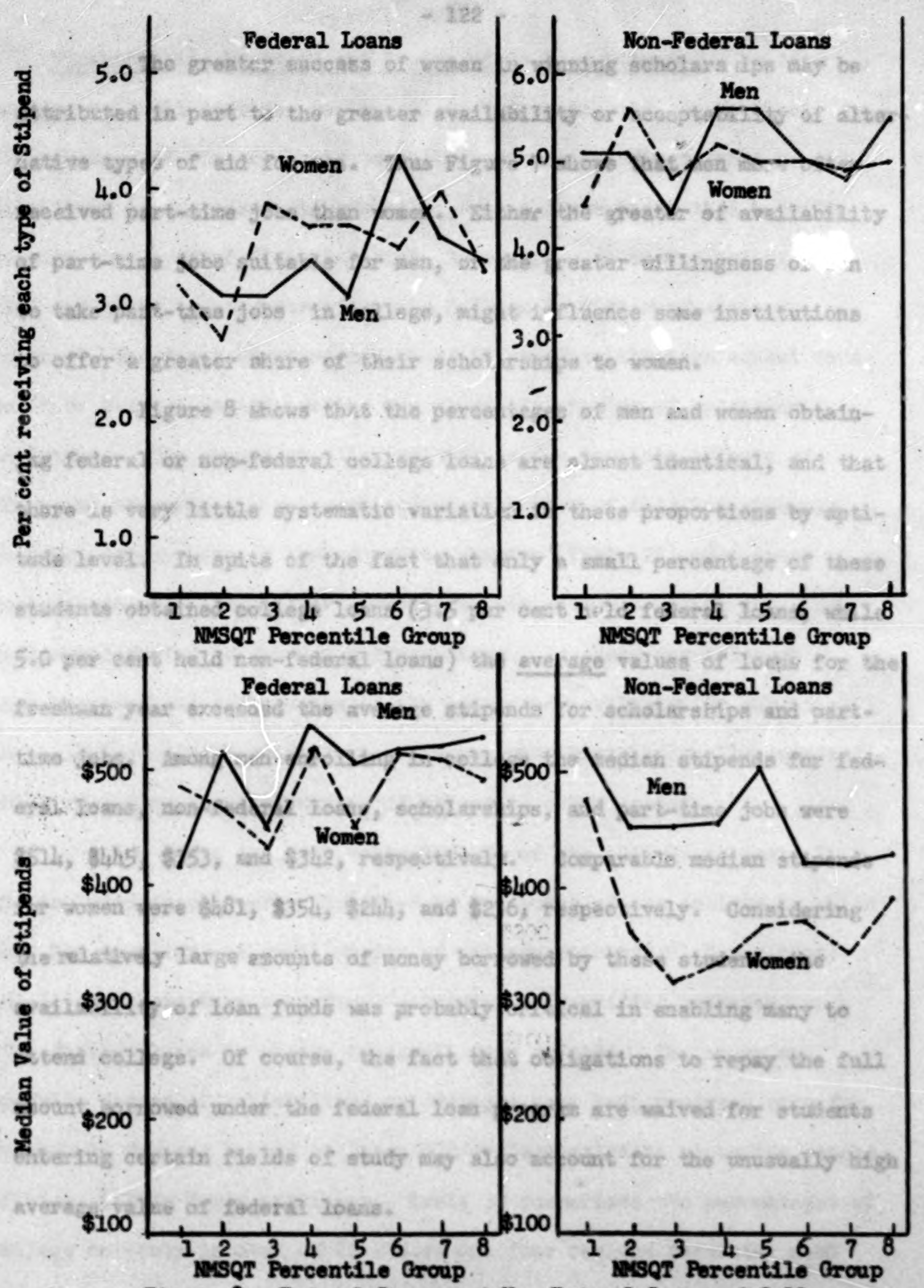


Figure 7. Scholarships and Part-time Jobs of College Entrants Classified by Sex and Aptitude Level


Federal Loans

Non-Federal Loans

Federal Loans

Non-Federal Loans

Figure 8. Federal Loans and Non-Federal Loans of College Entrants Classified by Sex and Aptitude Level

The greater success of women in winning scholarships may be attributed in part to the greater availability or acceptability of alternative types of aid for men. Thus Figure 7 shows that men more often received part-time jobs than women. Either the greater of availability of part-time jobs suitable for men, or the greater willingness of men to take part-time jobs in college, might influence some institutions to offer a greater share of their scholarships to women.

Figure 8 shows that the percentages of men and women obtaining federal or non-federal college loans are almost identical, and that there is very little systematic variation in these proportions by aptitude level. In spite of the fact that only a small percentage of these students obtained college loans (3.5 per cent held federal loans, while 5.0 per cent held non-federal loans) the average values of loans for the freshman year exceeded the average stipends for scholarships and part-time jobs. Among men enrolling in college the median stipends for federal loans, non-federal loans, scholarships, and part-time jobs were $514, $445, $353, and $342, respectively. Comparable median stipends for women were $481, $354, $244, and $236, respectively. Considering the relatively large amounts of money borrowed by these students the availability of loan funds was probably critical in enabling many to attend college. Of course, the fact that obligations to repay the full amount borrowed under the federal loan program are waived for students entering certain fields of study may also account for the unusually high average value of federal loans.

Financial Aid by State and Region of College Attended. In this section we shall consider two questions concerning the geographical distribution of financial aid to college students: First, what is the likelihood if a student attends college in a given state that he will receive some type of financial aid? Second, how do amounts of financial aid given to students attending college in different states compare? The first question may be of interest to the high school counselor or student in considering the student's chances of receiving assistance. The second question relates to the possible effects of financial aid upon the geographical distribution of talented students. We have already seen in the preceding chapter (Table 23) that state governmental agencies differ markedly in the extent to which they provide scholarships to finance college costs. Is there any evidence that geographical differences in the resources available for subsidizing talented college students leave some areas "intellectually denuded" while resulting in an abundance of talent in other areas?

For these analyses virtually all of the college entrants in the analyzed sample were classified by the state of the college in which they had enrolled. A small number of college entrants (1.8 per cent) enrolling in military academies, attending unidentified colleges, or attending colleges in Alaska or Hawaii were omitted. To insure a moderate degree of reliability, percentages have been reported only for states and regions having at least 300 college entrants among the sample of high-ability Merit examinees. Table 30 summarizes the percentages of college entrants in each of 26 states and four regions receiving each type of financial aid.

There are sizeable regional differences in the percentages holding part-time jobs, but only small regional differences in the percentages receiving scholarships or obtaining loans. Approximately 34 per cent of the college entrants in the West and Southwest reported they expected to hold a part-time job, while only about 23 per cent of the entrants in the Southeast and North Atlantic regions had similar expectations.

State differences in the percentages expecting to hold part-time jobs are large, as are differences in the percentages holding scholarships. There is some tendency for states having unusually high percentages of their college entrants holding scholarships to also have unusually high percentages holding part-time jobs. Thus of the 13 states ranking highest in the percentage holding scholarships nine also ranked highest in the percentage holding part-time jobs, and of the 13 states ranking lowest in the percentage holding scholarships nine also ranked lowest in the percentage holding part-time jobs. Illinois, Kansas, Missouri, and Washington all have unusually high percentages of their college entrants holding scholarships and part-time jobs, while Georgia, Pennsylvania, and Virginia all have unusually low percentages holding scholarships and part-time jobs. On the other hand, Louisiana ranked highest in the percentage holding scholarships but near the bottom with respect to the percentage holding part-time jobs; California ranked second from last in the percentage holding scholarships but near the top in the percentage holding jobs.

Table 30

Frequency of Financial Aid to Merit Examinees Classified by State and Geographical Region of College Attended

State and region of college attended	Number of examinees attending college in given state or region*	Percentage of examinees receiving given type of financial aid‡			
		Scholarship	Federal Loan	Non-Federal Loan	Part-time Job
North Atlantic	5,281	31.1	4.0	6.8	23.4
Mass.	909	33.8	.9	7.0	21.6
N. Y.	1,561	32.8	3.9	4.9	24.0
N. J.	363	30.6	1.4	6.1	28.4
Pa.	1,348	28.6	5.9	8.5	22.8
Other states (Conn., Del., Me., Md., N.H., R.I., Vt., D.C.)	1,100	29.5	4.2	7.2	23.5
North Central	6,687	34.3	3.7	4.4	31.3
Ill.	946	42.0	2.3	2.9	34.8
Mo.	491	37.9	4.5	4.3	35.6
Kan.	348	37.4	3.2	2.0	35.3
Iowa	441	35.1	3.4	5.9	32.9
Minn.	537	32.8	6.9	4.1	39.3
Wisc.	593	32.7	3.7	5.1	27.8
Ind.	798	32.6	4.4	4.9	21.4
Ohio	1,198	31.1	3.3	5.7	25.3
Mich.	954	27.0	3.5	3.6	33.2
Other states (Neb., N.D., S.D.)	381	42.5	3.1	4.5	39.9
Southeast	4,537	31.1	4.3	5.8	23.1
La.	409	46.5	4.2	4.2	20.0
Tenn.	462	35.9	3.7	6.1	31.6
N. C.	753	34.1	4.0	5.7	17.0
Ky.	300	30.3	8.7	5.7	39.3
Va.	474	28.1	2.7	5.7	10.3
Ala.	340	25.9	5.6	4.4	23.8
Ga.	421	25.7	3.8	5.7	23.5
Fla.	378	23.5	4.0	6.6	26.5
Other states (Ark., Miss., S.C., W. Va.)	1,000	29.0	4.1	6.7	24.5
West and Southwest	4,885	31.5	2.4	3.4	33.9
Okla.	371	36.4	5.1	4.9	33.2
Wash.	387	35.1	1.3	2.6	37.2

Table 30 (Cont'd)

State and region of college attended	Number of examinees attending college in given state or region	Percentage of examinees receiving given type of financial aid			
		Scholarship	Federal Loan	Non-Federal Loan	Part-time Job
West and Southwest (cont'd)					
Tex.	1,083	32.5	3.1	5.1	24.9
Colo.	316	32.3	2.2	3.2	23.1
Calif.	1,803	25.3	1.7	2.4	37.2
Other states (Ariz., Idaho, Mont., Nev., N.Mex., Ore., Utah, Wyo.)	925	38.5	2.2	3.0	40.8
TOTALS	21,390	32.0	3.5	5.0	28.2
All qualified examinees attending college full-time	21,778	32.0	3.5	5.0	27.9

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*Does not include 112 men enrolling in military academies, 208 students attending unidentified colleges, and 68 students attending colleges in Alaska or Hawaii.

‡Percentages are reported separately only for states and regions in which 300 or more examinees attended college; states are listed within region in order of the percentage receiving scholarships.

Finally, we consider the question of whether colleges in some states enroll more than their expected share of talented students, and if so whether financial aid resources are related to their ability to attract talent. The degree to which colleges in a given state enroll more talented students than that state produces can be estimated by comparing the geographical distributions of high-ability Merit examinees before and after entering college. The first two columns of Table 31 summarize percentages of college-enrolled examinees graduating from high school, and attending college, in each state. In addition Figure 9 shows a scatter-plot for the two sets of percentages for each of the 26 states for which percentages are reported. It is apparent that the percentage of examinees attending college in a given state is highly predictable from the percentage attending high school in that state, and that the six states identified in Figure 9 are those most deviant with respect to relative "drawing power". Massachusetts, Indiana, and Colorado attracted noticeably greater percentages of these college entrants than would be expected on the basis of where these students attended high school. New Jersey, Illinois, and New York, on the other hand, attracted noticeably smaller percentages of these students than expected considering their high school origins.

An index of the relative "drawing power" of each state is the residual error in predicting the percentage enrolled in a given state from the percentage attending high school in that state. A simple approximation of these residual errors for each state is provided by the

Table 31

Value of Financial Aid to Merit Examinees Classified by State and Geographical Region of College Attended

State and geographical region of college attended	Per cent of examinees from given state or region (N=21,778)	Per cent of examinees attending college in given state or region (N=21,390)	Per cent of funds in each category going to students attending college in given state or region			
			Scholarship	Federal Loan	Non-Federal Loan	Part-time job
North Atlantic	24.5	24.7	33.3	26.2	37.7	19.6
Mass.	2.8	4.2	7.1	1.2	6.4	2.9
N. J.	2.8	1.7	1.9	.6	2.1	1.6
N. Y.	8.1	7.3	10.8	8.9	9.3	6.4
Pa.	6.2	6.3	6.6	9.9	12.7	4.7
Other states (Conn., Del., Me., Md., N.H., R.I., Vt., D.C.)	4.6	5.2	6.9	5.6	7.2	4.0
North Central	30.4	31.3	29.7	32.6	27.2	33.6
Ill.	5.3	4.4	6.6	2.7	2.4	6.1
Ind.	2.8	3.7	3.4	5.2	4.4	2.5
Iowa	1.9	2.1	1.6	1.6	2.7	2.2
Kan.	1.6	1.6	1.4	1.4	.6	1.7
Mich.	4.2	4.5	2.9	5.1	2.8	5.7
Minn.	2.5	2.5	2.0	4.5	1.4	3.3
Mo.	2.2	2.3	1.9	2.8	1.5	2.6
Ohio	5.4	5.6	5.6	5.1	7.0	4.9
Wisc.	2.5	2.8	2.3	2.8	3.0	2.5
Other states (Neb., N.D., S.D.)	2.0	1.8	2.0	1.4	1.4	2.1

Table 31 (Cont'd)

State and geographical region of college attended	Per cent of examinees from given state or region (N=21,778)	Per cent of examinees attending college in given state or region (N=21,390)	Per cent of funds in each category going to students attending college in given state or region			
			Scholarship	Federal Loan	Non-Federal Loan	Part-time Job
Southeast	22.1	21.2	18.2	24.4	21.3	15.2
Ala.	1.9	1.6	1.1	2.9	1.5	1.2
Fla.	1.9	1.8	1.5	2.5	2.1	1.8
Ga.	1.9	2.0	1.5	1.7	2.3	1.7
Ky.	1.5	1.4	1.0	2.8	1.4	1.6
La.	1.8	1.9	2.0	2.0	1.3	1.1
N. C.	3.1	3.5	3.7	3.4	3.9	1.7
Tenn.	2.2	2.2	2.0	2.0	1.9	2.1
Va.	2.2	2.2	2.1	1.9	2.6	.7
Other states (Ark., Miss., S.C., W. Va.)	5.6	4.6	3.3	5.2	4.3	3.3
West and Southwest	22.5	22.8	18.8	16.8	13.8	31.6
Calif.	8.4	8.4	7.1	4.6	3.9	14.0
Colo.	1.0	1.5	1.2	1.4	1.0	1.3
Okla.	1.8	1.7	1.5	2.3	1.6	2.1
Tex.	5.2	5.1	4.0	4.9	4.2	4.7
Wash.	1.9	1.8	1.3	.8	.7	2.7
Other states (Ariz., Idaho, Mont., Nev., N. Mex., Ore., Utah, Wyo.)	4.2	4.3	3.7	2.8	2.4	6.8
Outlying Parts	.5					
Hawaii	.4					
Alaska	.1					
TOTALS	100.0	100.0	100.0	100.0	100.0	100.0

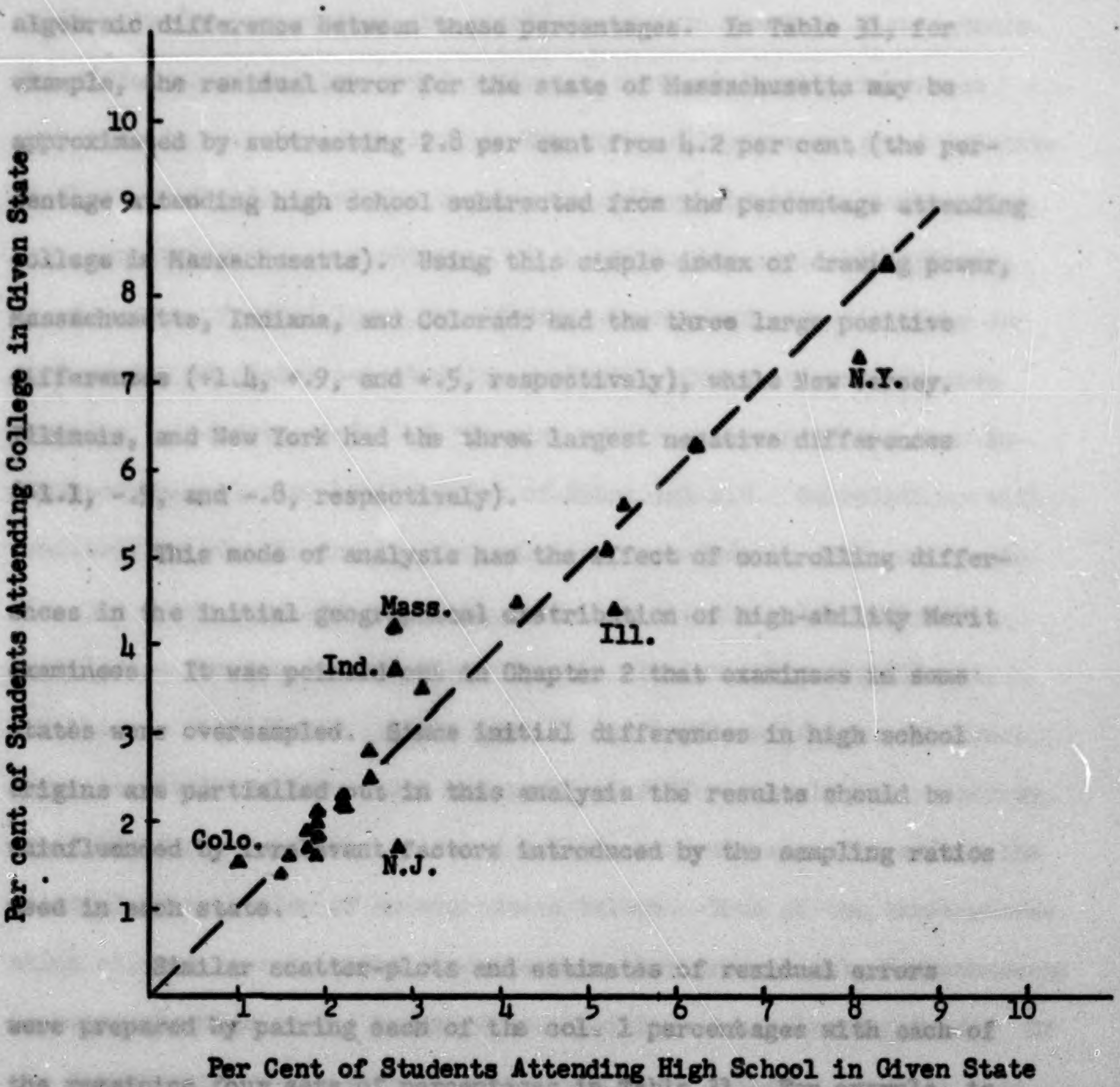

Figure 9. Scatter-plot Relating Geographical Locations of Colleges and High Schools Attended by Merit Examinees

algebraic difference between these percentages. In Table 31, for example, the residual error for the state of Massachusetts may be approximated by subtracting 2.8 per cent from 4.2 per cent (the percentage attending high school subtracted from the percentage attending college in Massachusetts). Using this simple index of drawing power, Massachusetts, Indiana, and Colorado had the three large positive differences (+1.4, +.9, and +.5, respectively), while New Jersey, Illinois, and New York had the three largest negative differences (-1.1, -.9, and -.8, respectively).

This mode of analysis has the effect of controlling differences in the initial geographical distribution of high-ability Merit examinees. It was pointed out in Chapter 2 that examinees in some states were oversampled. Since initial differences in high school origins are partialled out in this analysis the results should be uninfluenced by irrelevant factors introduced by the sampling ratios used in each state.

Similar scatter-plots and estimates of residual errors were prepared by pairing each of the col. 1 percentages with each of the remaining four sets of percentages in Table 31. For example, to obtain an index of the relative availability of financial aid in each state we may calculate the difference between the percentage of scholarship funds awarded to college-enrolled examinees attending college in a given state and the percentage of examinees graduating from high schools in that state. Thus 10.8 per cent of the scholarship funds received by this group of examinees went to students going to college in New York, while only 8.1 per cent of the examinees went to New York high schools. The difference (+2.9 per cent) indicates that scholarship resources available to entrants enrolling in New York colleges were great relative to those available to students going to colleges in other states. In this manner indices were obtained of the "relative availability" of scholarships, federal loans, non-federal loans, and part-time jobs for each of the 26 states selected for analysis. Correlations were then computed between the index of "drawing power" and each of the four indices of the relative availability of financial aid. Correlations with availability of scholarship, federal loan, non-federal loan, and part-time job funds were .30, .24, .41, and .10, respectively. Only the correlation for non-federal loan funds is statistically significant, and this is significant at only the .05 level of confidence. In short, there is little evidence that geographical differences in the resources available for subsidizing talented college students markedly affect the national distribution of undergraduate talent. Thus of the three states which attract more talented students than they produce only Massachusetts is extremely high on the index of availability of scholarship funds. Of the three states which attract noticeably fewer talented students than they produce only one (New Jersey) seems to have an unusual scarcity of scholarship funds. New York in fact is unusually high on the index of availability of scholarship but yet attracts noticeably fewer talented students than it produces.

Summary

We have seen that financial aid to talented college entrants during the freshman year most often takes the form of scholarships, particularly among men and women ranking in the top five per cent of the aptitude distribution. The competition among colleges to enroll these students is keenest, and as we saw in chapter 3 talent loss at this ability level is very small. However, among students ranking slightly below the 95th percentile on college aptitude tests both the frequency of scholarship aid and the median value of scholarship stipends drop sharply. It is apparent that scholarships, our most powerful incentives for recruiting youth into higher education, are in short supply among the very students who are most likely to discontinue their education. The results which we have presented on where the greatest losses of talent occur, the reasons for loss of the able, and the existing distribution of financial aid to college entrants all point to the need for additional scholarship aid for talented students whose test scores place them slightly below the upper five per cent of the ability distribution.

Loan programs accounted for a relative percentage of the financial aid opportunities utilized by these students. Less than four per cent held federal loans, while five per cent held other types of loans. The total value of assistance received in the form of scholarships was about seven and a half times the value of assistance received in the form of federal loans. Even if unlimited loan funds were available, there are good reasons why loans are not ideal incentives for recruiting students into higher education. As we have already noted, nearly half of those discontinuing school say they would not be willing to apply for a federal loan to help pay college costs. Loans have negative values associated with them, and it is doubtful that they can serve as effective incentives for students who are undecided about entering college.

Additional incentives for recruiting talented youth are needed, and the need will become greater as college enrollments increase. There is a very real danger that, with the mounting pressures to accommodate those who are able to pay their own way, we may lose sight of the many able young men and women who will need help to pay college costs.

Chapter 8

EFFECTS OF HONORARY AWARDS

So far we have dealt mainly with financial aid as means of reducing talent loss. In this chapter we turn to a consideration of some of the effects of social recognition upon the educational decisions of talented youth.

One form which a national program of talent development might take is to give increased social recognition to exceptionally talented young people. Coleman (1961) has recently proposed that we attempt to encourage interscholastic competitions in which schools compete with each other in intellectual contests. In this way, he argues, we might correct the present imbalance in which scholastic achievement fares poorly with athletics as a means of achieving acceptance among peers. There are, of course, many ways of giving recognition to intellectual achievement; undoubtedly these devices vary in their effects. The results to be reported are most clearly generalizable to honorary awards given to students for outstanding performance on scholastic or achievement tests. Conceptually, such recognition awards are similar to those used by most high schools to give recognition to superior scholastic achievement. High schools, for example, often publish honor rolls, award medals, or invite valedictorians to give commencement talks. On the other hand, such individual awards lack the element of group competition which Coleman's proposals envisage. It seems likely that individual recognition awards will prove to be much less effective than the group-centered procedures described by Coleman. Although the results are based upon a study of the effects of honorary awards an attempt has been made to conceptualize effects in terms which may be at least partially generalizable to new situations.

Each year the Merit Corporation gives two kinds of honorary awards to students with outstanding performances on the scholarship qualifying test: First, a Certificate of Merit is given to all finalists attesting to their "high potential for college achievement by a distinguished performance on the nationwide selection tests for Merit scholarships." The name of each C of M winner is published in a booklet distributed to colleges and universities, and to other scholarship-granting agencies. Second, a Letter of Commendation, commending the student for "a superior performance" on the NMSQT, is given to students who narrowly miss qualifying as finalists. The letter calls attention to the fact that commended students and C of M winners together constitute less than two per cent of all secondary school seniors, and suggests that a copy of the letter be sent by the recipient or his high school principal to the admissions office of the college to which the student is seeking admission. Both groups of students frequently receive additional recognition in high school assemblies and local newspapers.[1]

These awards are distributed so that the number receiving awards in each state is proportional to the number of public high school graduates in each state. Since there are sizeable geographical differences in performance on the NMSQT, different qualifying scores are set for each state. Thus in 1959 qualifying scores for the Letter of Commendation and the

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[1] Counts of press clippings provided the Merit Corporation by a clipping service indicates that C of M winners typically receive about two and a half times more newspaper coverage than commended students.

Certificate of Merit in Alabama were 120 and 127, respectively, while the corresponding qualifying scores for examinees in the District of Columbia were 146 and 151, respectively. In other words it was possible for examinees in D. C. who did not qualify for either award to have higher test scores than C of M winners in Alabama.[2] Generally, honorary awards were given only to examinees with extremely high test scores. In order to qualify for the Letter of Commendation, examinees in 38 of the 50 states had to have scores of 130--equivalent to a percentile rank of 97 relative to estimated national norms--or higher. Since talent loss among examinees at this ability level is extremely small, it was not possible to adequately study how winning such an honorary award affects the probability that the student will enroll in college.

Possible Effects Suggested by Student Reports

A number of hypotheses concerning the effects of honorary awards have been suggested by asking Certificate of Merit winners in the Merit program "How did winning a C of M help you?" A study of such retrospective appraisals was reported by Holland and Stalnaker (1957); largely on the basis of these results Thistlethwaite (1961) outlined a theory of the effects of social recognition upon the plans of talented students to seek advanced training. Motivation of high school students to seek advanced training was postulated to be a function of four dispositions: evaluation of self relative to others, ability to finance the costs of higher education, ability to gain admission to preferred educational programs, and perception of social support among others for intellectual achievement. To the extent that honorary awards (or social recognition for outstanding intellectual achievement) affect one or more of these dispositions we expect them to affect motivation for advanced training.

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[2] Although NMSQT scores were the primary basis upon which awards were made, examinees had to satisfy additional requirements. Students qualifying for the Letter of Commendation had to complete and return a brief questionnaire to the Merit Corporation, while those qualifying for the C of M had to have their high scores confirmed by a second test (the CEEB Scholastic Aptitude Test) and were required to complete and return a questionnaire. Typically less than three per cent of the examinees who qualify for recognition fail to meet these requirements.

Obviously when we are concerned with changes in student dispositions resulting from exposure to honorary awards it should make some difference what the student's dispositions were immediately before the award. For example, a person having a very favorable evaluation of himself relative to others before the award would not be expected to change his self-evaluations much as a result of the award. Consequently, additional interaction hypotheses were stated relating changes in the person's attitudes, abilities, and perceptions to background characteristics and environmental events. Specifically, these hypotheses were:

1. Recognition will affect the student's knowledge of his capacities and his evaluation of self relative to others when the student:
    a. has had little opportunity to evaluate his abilities by objective measures, or
    b. is a "late bloomer"--i.e., when prior to recognition he had a relatively undistinguished record of academic achievement.
2. Recognition will increase ability to finance college costs by aiding the student to obtain scholarship assistance when he is:
    a. from a home or community of relatively low socio-economic status, or
    b. planning to attend a high-cost college.

3. Recognition will increase the student's ability to gain admission to preferred educational programs and institutions when he is:
    a. from a home or community of relatively high socio-economic status, or
    b. planning to attend a high-cost college.

4. Recognition will produce increased social support for the student's advanced training when:
    a. others' expectations of the student's intellectual performance are exceeded, or
    b. others who have the power to assist or thwart the student's plans to seek advanced training are not already committed to support such plans.

Thistlethwaite (1961) reported tests for three of the four dispositional hypotheses and for six of the eight interaction hypotheses, based upon a new sample of retrospective appraisals of C of M winners in the Merit program. Briefly, there was some evidence that the C of M award increased motivation for advanced training primarily among those students who reported that the award improved their self-evaluations or that it led to increased ability to pay college costs (by helping them to win scholarships); there was no evidence that changes in motivation for advanced training were dependent upon changes in ability to gain admission to preferred colleges. The first six of the preceding interaction hypotheses were all either confirmed or partially confirmed.

However, these results can only be regarded as suggestive. For one thing, there is a possibility that response biases produced some of the observed relationships. If some respondents were disposed to check numerous alternatives (i.e., ascribe many positive effects from receiving a C of M award), while others were disposed to check none, then the observed relationships between reported changes in dispositions would follow. Although responses biases cannot readily account for confirmation of the interaction hypotheses, a number of alternative rival explanations might be advanced for these relationships. Such interpretative ambiguities are inherent in correlational studies; for more definitive tests of the theory we must turn to a design which provides a more persuasive test of the presence or absence of effects.

A Test of Effects of the Letter of Commendation

Regression-Discontinuity Analysis. In situations such as the foregoing, where exposure to an experimental treatment (in this case, an honorary award) is determined by the subject's standing on a single, measured variable examination of the details of the regression may be used to assess experimental effects. When the expected effects of the treatment are of much the same nature as would be produced by increasing magnitudes of that variable, the experimental treatment should provide an additional elevation to the regression of dependent variables on the exposure determiner, providing a steplike discontinuity at the cutting score.

The argument can be made more specific by considering a "true" experiment for which the present analysis may be regarded as a substitute. It would be both indefensible and infeasible to conduct an experiment in which a random sample of examinees along the whole range of abilities would be given the Letter of Commendation while a randomly equivalent group received no award. However, a group of examinees who narrowly missed qualifying for the minimal award might be given the opportunity of receiving recognition. Thus examinees in Alabama with scores of 119 (one unit below the cutting score) migh be randomly assigned to the different treatments of honorary award and no award. The two half-circle points at -1 for Line AA' in Figure 10 illustrate a possible outcome for such a true experiment, the solid half-circle representing the award group and the hollow half-circle the no award group. Alternatively, a similar true experiment might be carried out among examinees whose test scores equalled the cutting score (Score 0 in Figure 10). The analysis to be presented attempts to simulate the latter of these two experiments, by extrapolating from the below-cutting-point line to an "untreated" Point 0 value (an inferred substitute for the no award control group). Thus one measure of the effect of the treatment would be the discrepancy between the extrapolated point for Score 0 (shown as a full circle in Figure 10) and the observed point for this score. A second measure of the treatment effect would consist in determining, by covariance analysis, whether a single regression line fits the observed points for both populations as well as the separate regression lines. Outcomes such as those shown in Line AA' would, of course, be strictly demonstrated only for aptitude levels fairly close to the cutting score, and inferences about the effects of awards at other ability levels would be made in hazard of unexplored interactions of award and ability level. Inferences as to what the regression line would have looked like without the honorary award become more and more suspect the further the no award experience of Points -7 to -1 has to be extrapolated. The extrapolation is best for Point 0 and becomes increasingly implausible for examinees having scores which greatly exceed the cutting score.

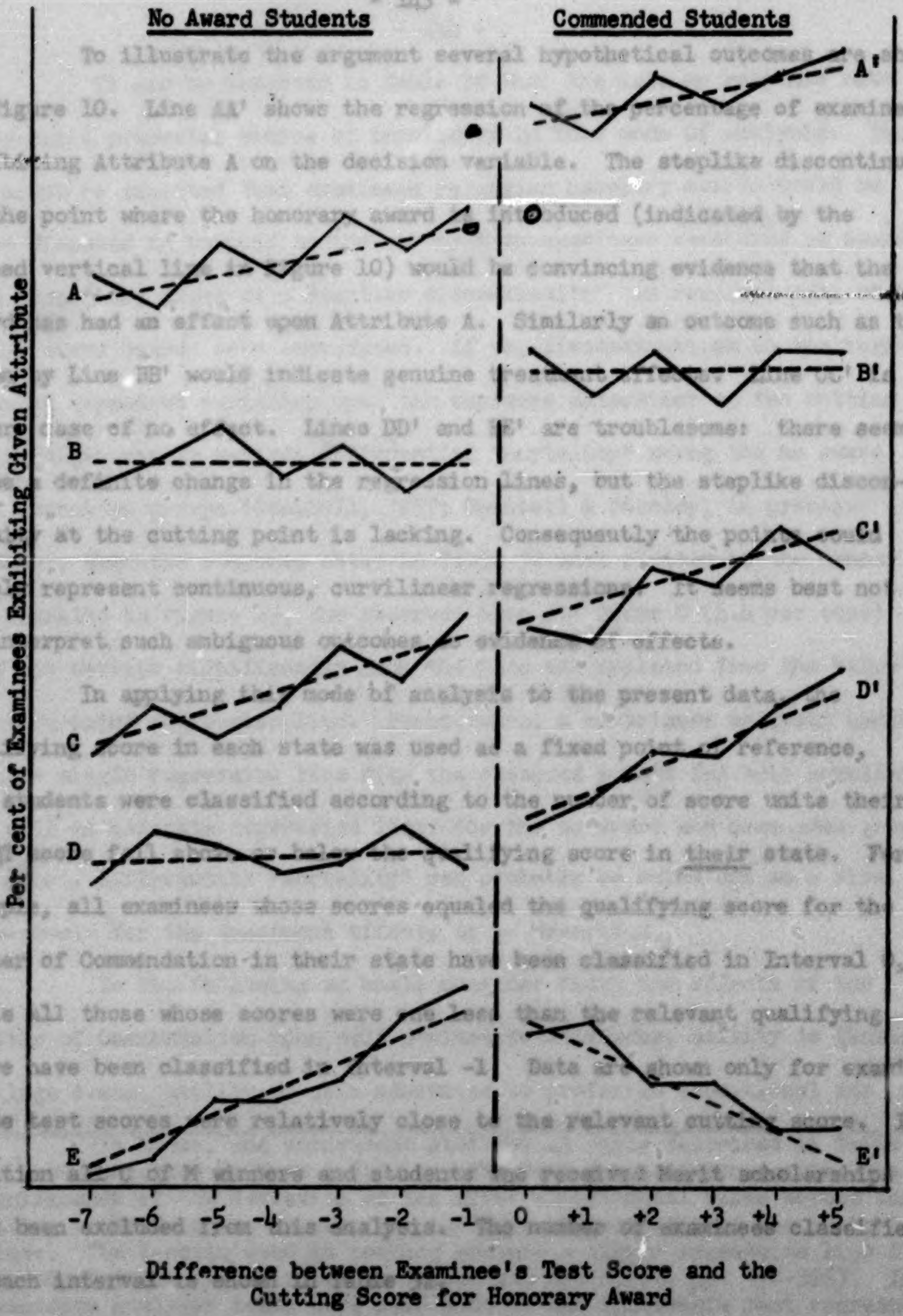

Figure 10. Hypothetical Outcomes of a Regression-Discontinuity Analysis of Effects of an Honorary Award

To illustrate the argument several hypothetical outcomes are shown in Figure 10. Line AA' shows the regression of the percentage of examinees exhibiting Attribute A on the decision variable. The steplike discontinuity at the point where the honorary award is introduced (indicated by the dashed vertical line in Figure 10) would be convincing evidence that the award has had an effect upon Attribute A. Similarly an outcome such as that shown by Line BB' would indicate genuine treatment effects. Line CC' is a pure case of no effect. Lines DD' and EE' are troublesome: there seems to be a definite change in the regression lines, but the steplike discontinuity at the cutting point is lacking. Consequently the points could merely represent continuous, curvilinear regressions. It seems best not to interpret such ambiguous outcomes as evidence of effects.

In applying this mode of analysis to the present data, the qualifying score in each state was used as a fixed point of reference, and students were classified according to the number of score units their NMSQT score fell above or below the qualifying score in their state. For example, all examinees whose scores equaled the qualifying score for the Letter of Commendation in their state have been classified in Interval 0, while all those whose scores were one less than the relevant qualifying score have been classified in Interval -1. Data are shown only for examinees whose test scores were relatively close to the relevant cutting score. In addition all C of M winners and students who received Merit scholarships have been excluded from this analysis. The number of examinees classified in each interval is shown in Table 32.

It can be observed in Table 32 that the data on response rate rule out a potential source of invalidity in this mode of analysis. Thus it might be expected that examinees receiving honorary awards would be more disposed to respond to the survey than examinees receiving no award, and that there might be a steplike discontinuity in response rate at the point where awards were introduced. If so, discontinuities in the regression of dependent variables upon the exposure determiner at the cutting point might merely reflect differential "mortality" among the no award and commended groups (Campbell, 1957; Campbell & Stanley, in press). However, when the response rates in Table 32 were plotted in the manner illustrated in Figure 10, the observed rate for Score 0 (4.4 per cent) did not deviate significantly from the rate extrapolated from the below-cutting-point regression line. Furthermore, a covariance analysis indicates that a single regression line fits the observed points for both populations as well as separate regression lines for the no award and commended groups.[3] In short, differential "mortality" can probably be ruled out as a rival hypothesis for the treatment effects to be described.

In the following we shall consider first the effects of the Letter of Commendation upon self-evaluative attitudes, ability to finance college costs, ability to gain admission to preferred educational institu-

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[3] In these, and subsequent statistical tests described in Table 33, a t test described by Mood (1950, pp. 297-298) was used for testing the significance of the deviation of the first experimental value beyond the cutting point from the value predicted from a linear fit of the control values. The F-ratio used in testing whether a single regression line fits both populations is described by Walker and Lev (1953, pp. 390-395). In all covariance analyses tests were also made of the hypothesis that regression lines for both populations had a common slope; in all cases (where significant differences between experimental and control group were found) this hypothesis was tenable, indicating that the assumption of homogeneity of regression was satisfied.

Table 32

Examinees Classified by Proximity of Test Score to Cutting Scores Used for the Letter of Commendation

Difference between test score and cutting score (1)	Number in designated sample (2)	Number in analyzed sample (3)	Per cent in col. 2 not responding (4)	Difference between examinee's test score and cutting score (5)	Number in designated sample (6)	Number in analyzed sample (7)	Per cent in col. 6 not responding (8)
No Award Examinees							
-22	686	622	9.3	- 3	276	260	5.8
-21	660	587	11.1	- 2	237	215	9.3
-20	650	594	8.6	- 1	241	230	4.6
-19	612	546	10.8	Totals	10,001	9,168	8.3
-18	570	512	10.2	**Commended Students**			
-17	587	537	8.5				
-16	562	514	8.5	0	227	217	4.4
-15	558	507	9.1	+ 1	234	212	5.1
-14	537	498	7.3	+ 2	203	195	3.9
-13	442	403	8.8	+ 3	167	157	6.0
-12	468	434	7.3	+ 4	145	138	4.8
-11	467	426	8.8	+ 5	123	121	1.6
-10	394	367	6.9	Totals	1,099	1,040	5.4
- 9	366	347	5.2				
- 8	348	325	6.6				
- 6	333	316	5.1				
- 5	320	296	7.5				
- 4	281	255	9.3				

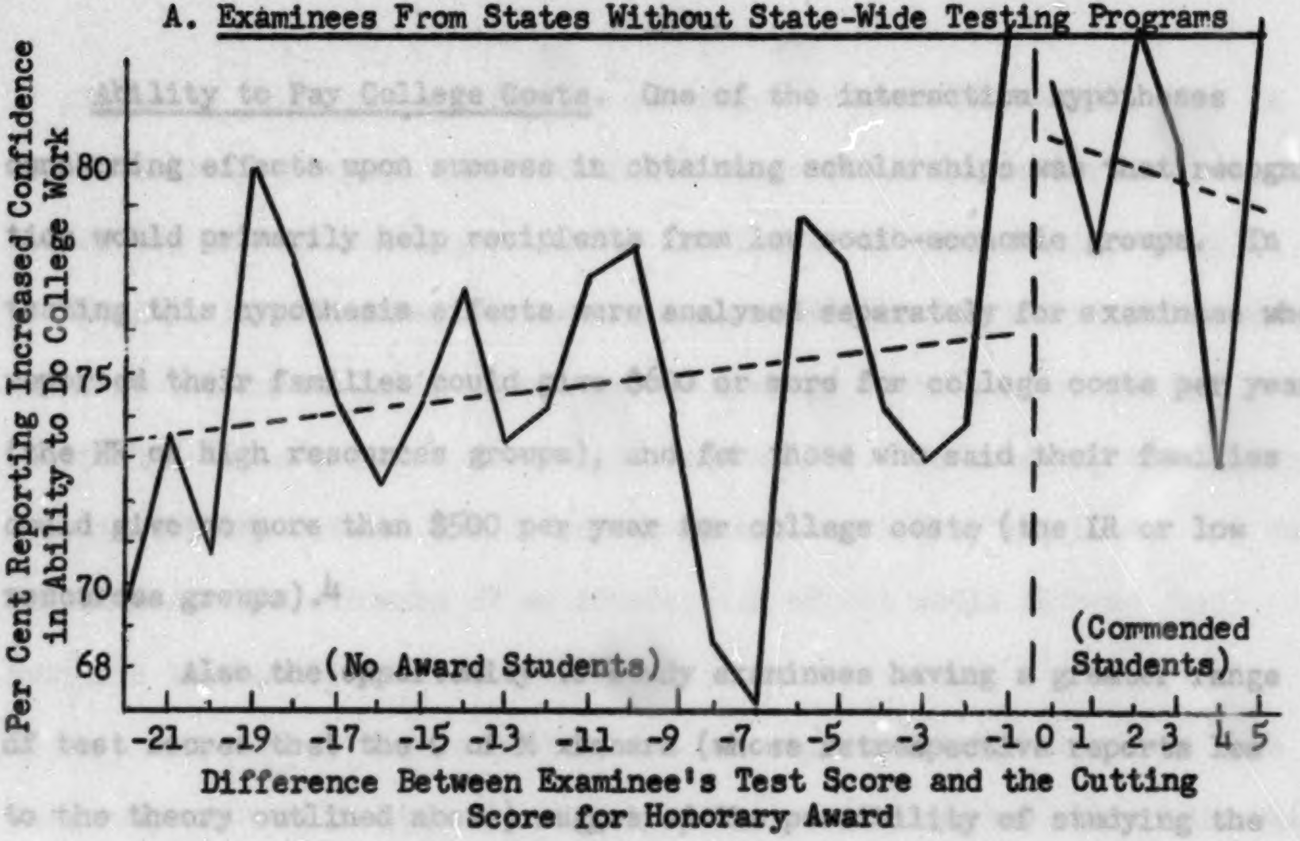
tions, and perception of social support from parents and teachers. Where possible, breakdowns were made by student background traits in order to test the specific interaction hypotheses outline above. Finally effects upon three indices of educational motivation are described.

Self-evaluative attitudes. According to the theory outlined above, recognition should affect the examinee's self-evaluative attitudes primarily when he has had little opportunity to evaluate his abilities by objective measures, or is a "late bloomer." A crude index of the examinee's previous opportunity to evaluate his abilities by objective measures was obtained by noting whether the examinee attended secondary school in a state with a large-scale state or university testing program (Educational Testing Service, 1957). "Late bloomers" consisted of examinees obtaining test scores much higher than expected on the basis of their high school ranks. Although high school ranks were available for approximately 90 per cent of the examinees, relatively few of the students qualifying for recognition in the Merit program had low high school ranks. Of 950 winners of the Letter of Commendation for whom high school ranks were available, only 234 had high school ranks below the 85th percentile. This fact suggests that there were relatively few "late bloomers" among the students receiving recognition.

Each student was asked the question, "After you learned the outcome of your participation in programs for identifying and recognizing scholastic achievement, did you have greater confidence in your ability to do college work?" Plots of the percentages responding "yes" to this question are shown in Figure 11. The two plots show little indication of effect upon self-evaluative attitudes. In the upper plot (A) the difference between the expected and observed values at Score 0 is small, and while in the hypothesized direction, is exceeded by three other ascending gaps in the control data. Similarly, judging by the Mood test and by the covariance test this plot does not show a significant effect upon the self-evaluative attitudes of examinees from states not having a state-wide testing program.

In the lower plot (B) of Figure 11, there is a somewhat greater difference in the hypothesized direction between expected and observed values at Score 0, although its magnitude is exceeded by one of the ascending gaps for the control data. The effect is not statistically significant on the basis of the Mood test, but is significant ($p<.025$) on the basis of the covariance analysis. The picture is ambiguous enough to leave us skeptical as to the effects of the award upon the examinee's self-evaluative attitudes. In short, the results neither clearly confirm nor deny the interaction hypothesis concerning effects upon the self-confidence of the "late bloomer."

Similar plots were made for examinees from states having state-wide testing programs and for those with high school ranks equivalent to the 85th percentile or higher. However, neither the graphic plots nor the statistical tests indicated any effect upon the self-evaluative attitudes of these students.



A. Examinees From States Without State-Wide Testing Programs

B. Examinees Having High School Ranks Below the 85th Percentile

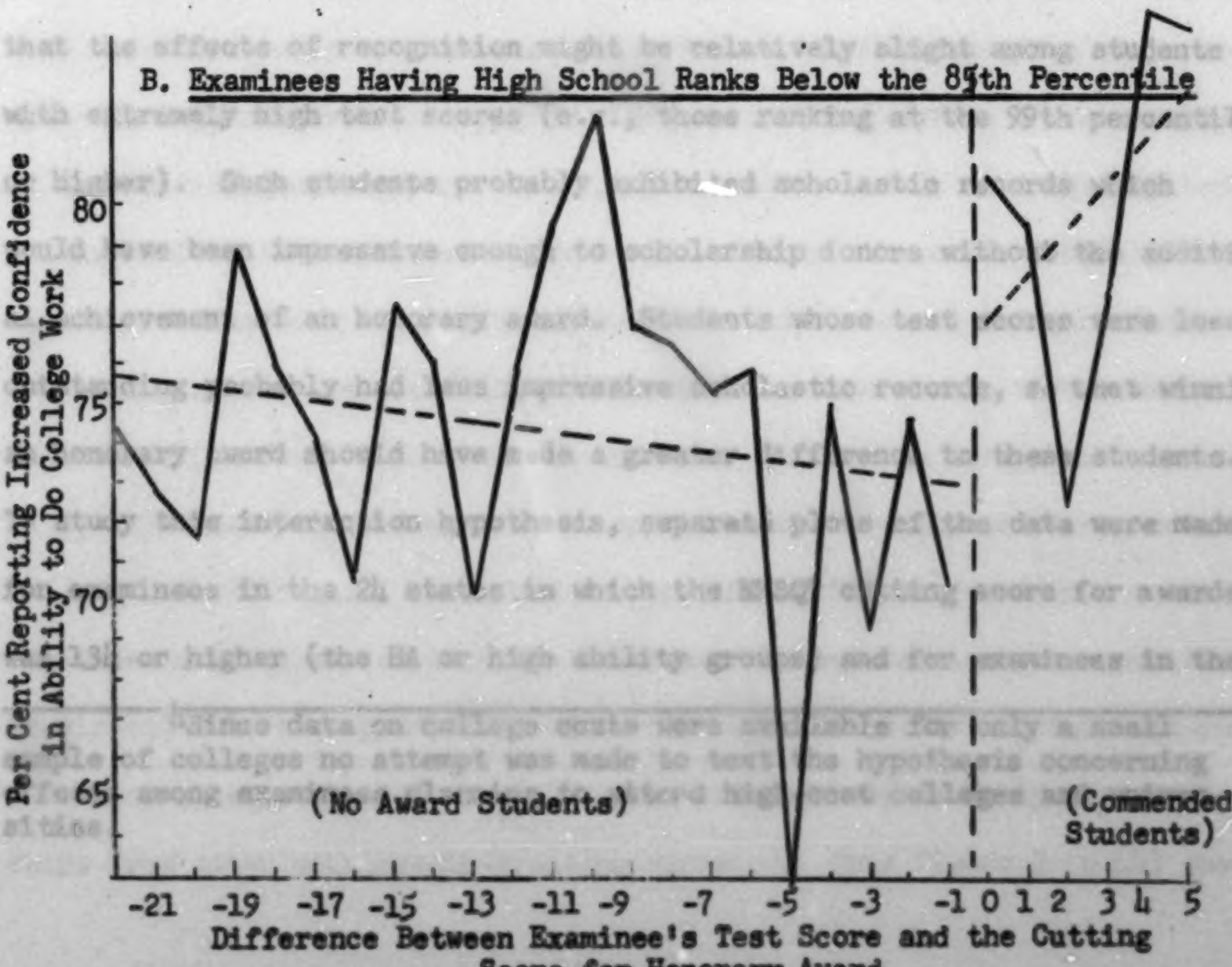


Figure 11 Regression of Self-Confidence Reports on Exposure Determiner

Ability to Pay College Costs. One of the interaction hypotheses concerning effects upon success in obtaining scholarships was that recognition would primarily help recipients from low socio-economic groups. In testing this hypothesis effects were analyzed separately for examinees who reported their families could give $600 or more for college costs per year (the HR or high resources groups), and for those who said their families could give no more than $500 per year for college costs (the LR or low resources groups).[4]

Also the opportunity to study examinees having a greater range of test scores that the C of M winners (whose retrospective reports led to the theory outlined above) suggested the possibility of studying the interaction of the honorary award and ability level. It seemed plausible that the effects of recognition might be relatively slight among students with extremely high test scores (e.g., those ranking at the 99th percentile or higher). Such students probably exhibited scholastic records which would have been impressive enough to scholarship donors without the additional achievement of an honorary award. Students whose test scores were less outstanding probably had less impressive scholastic records, so that winning an honorary award should have made a greater difference to these students. To study this interaction hypothesis, separate plots of the data were made for examinees in the 24 states in which the NMSQT cutting score for awards was 134 or higher (the HA or high ability groups) and for examinees in the

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[4] Since data on college costs were available for only a small sample of colleges no attempt was made to test the hypothesis concerning effects among examinees planning to attend high-cost colleges and universities.

27 states in which the cutting scores ranged between 120 and 133 (the LA or low ability groups). For the 14,460 respondents in the former group of states the average cutting score for the Letter of Commendation was 137 (equivalent to a national percentile rank of 98.5); for the 12,311 respondents in the latter group of states the average cutting score was 128 (equivalent to a national percentile rank of 96). To be sure, the difference in ability between the HA and LA groups was small, and it was not expected that much evidence of an interaction effect would be found for subjects in this limited ability range.

Contrary to expectation, the honorary award had no effect upon the frequency with which students with low financial resources won scholarships, but did significantly increase the likelihood that students with high financial resources would win scholarships. Figure 12 shows the plot of percentages winning scholarships among HR examinees. The steplike discontinuity at the cutting point appears visually persuasive, and is confirmed by both statistical tests summarized in Table 33. It can be seen in Table 33 that similar results were obtained when responses to three related questions concerning success in receiving scholarships or scholarship offers were considered (numbers in parentheses in Table 33 refer to item numbers in the Fall, 1959 survey questionnaire, a copy of which is included in Appendix G).

The financial resources groups (LR and HR) differed in a number of respects which may explain the fact that the interaction was opposite in direction to that predicted. Examinees with limited financial resources were less likely to enroll in college and less likely to apply for scholarships from other scholarship-granting agencies. Thus Figure 3 (p.44) shows that the percentages enrolling in college were smaller for groups with limited financial resources. Similarly, only 25 per cent of the examinees in the LR groups made two or more scholarship applications, while 36 per cent of those in the HR groups made two or more scholarship applications. We expected the honorary award to affect success in winning scholarships primarily when the recipient applied for admission to college and for scholarship aid to other donors. It seems clear that the HR groups exhibited both of these instrumental behaviors to a greater extent than the LR groups. To be sure, we cannot rule out the possibility that *if other things are equal*, recipients from low-income families would benefit more than those from high-income families with respect to success in winning scholarships. However, the absence of any significant effects among the LR groups casts doubt on the hypothesis, and suggests that the honorary award may primarily change the financial resources of those commended students who are already relatively well-to-do.

Figure 13 shows that the honorary award increased the likelihood that recipients from states with low qualifying scores would win scholarships. Table [illegible] shows that the visual appearance of this plot was confirmed by [illegible] statistical tests on all four of the questionnaire items relating to success in winning schola[illegible]ip offers. On [illegible] hand, no significant effects were observed among recipients from states with high qualify[illegible] the effects of the honorary award are greater among recipients whose test scores are high but not [illegible] of the high school population.

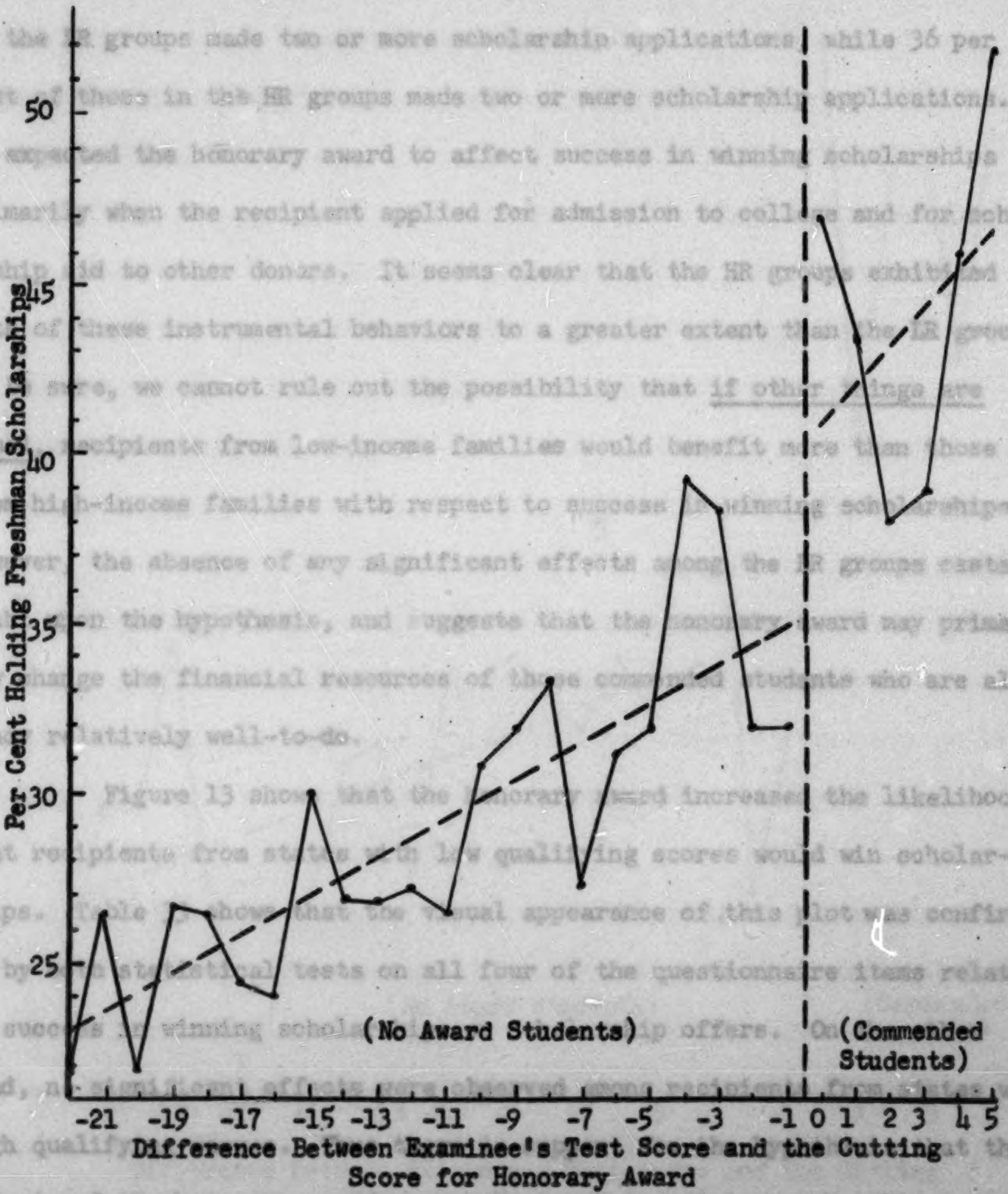

Figure 12 Regression of Success in Winning Scholarships on Exposure Determiner for Examinees from Families with High Financial Resources

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Figure 13 shows that the honorary award increased the likelihood that recipients from states with low qualifying scores would win scholarships. Table 33 shows that the visual appearance of this plot was confirmed by both statistical tests on all four of the questionnaire items relating to success in winning scholarships or scholarship offers. On the other hand, no significant effects were observed among recipients from states with high qualifying scores. Thus there is support for the hypothesis that the effects of the honorary award are greater among recipients whose test scores are high but not so high that they rank among the top one per cent of the high school population.

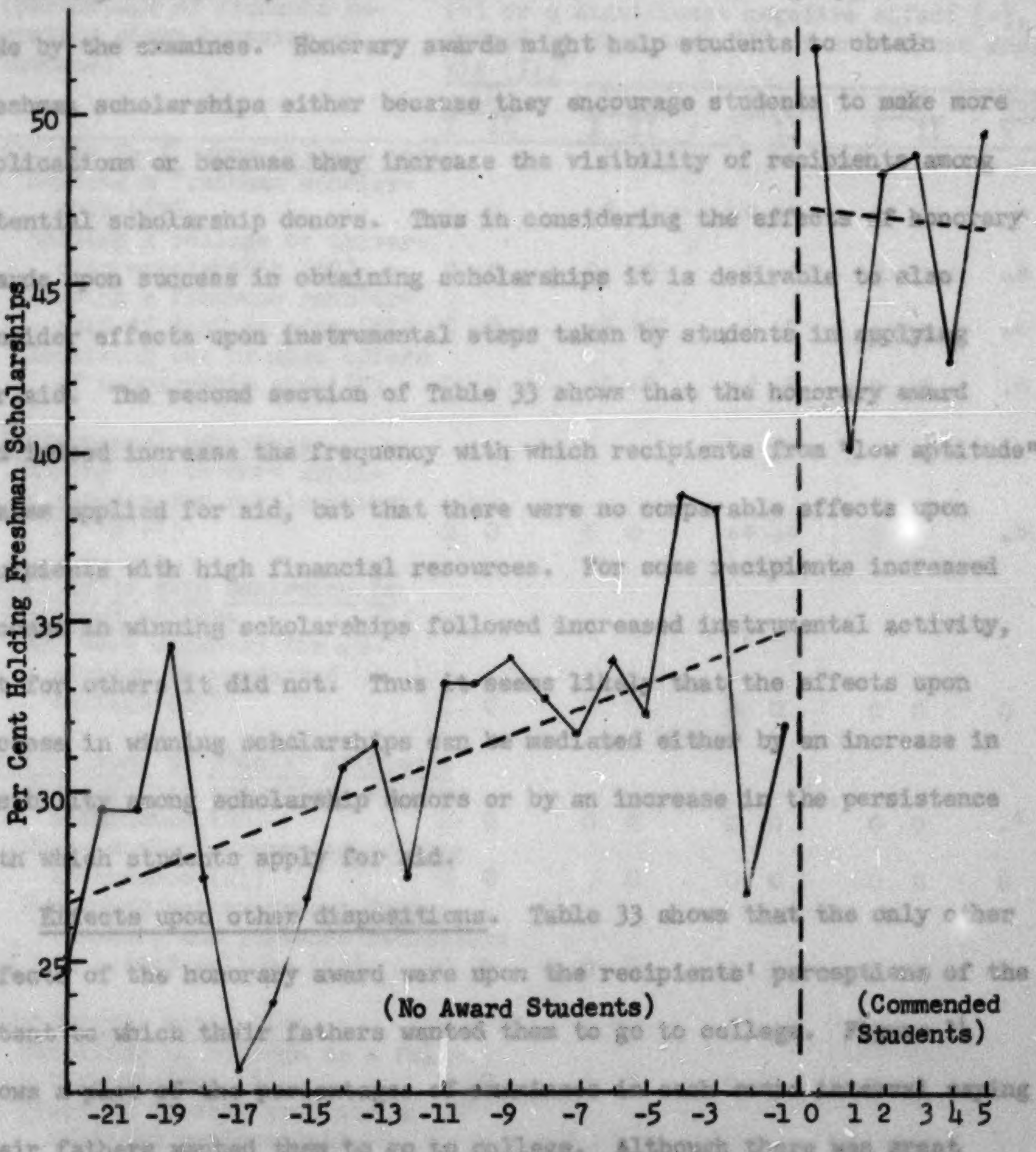

Figure 13 Regression of Success in Winning Scholarships on Exposure Determiner for Examinees from States with Low Cutting Scores

We saw in Chapter 5 that a relatively good predictor of success in winning scholarship offers was the number of scholarship applications made by the examinee. Honorary awards might help students to obtain freshman scholarships either because they encourage students to make more applications or because they increase the visibility of recipients among potential scholarship donors. Thus in considering the effects of honorary awards upon success in obtaining scholarships it is desirable to also consider effects upon instrumental steps taken by students in applying for aid. The second section of Table 33 shows that the honorary award did indeed increase the frequency with which recipients from "low aptitude" states applied for aid, but that there were no comparable effects upon recipients with high financial resources. For some recipients increased success in winning scholarships followed increased instrumental activity, but for others it did not. Thus it seems likely that the effects upon success in winning scholarships can be mediated either by an increase in visibility among scholarship donors or by an increase in the persistence with which students apply for aid.

Effects upon other dispositions. Table 33 shows that the only other effects of the honorary award were upon the recipients' perceptions of the extent to which their fathers wanted them to go to college. Figure 14 shows a plot of the percentages of examinees in each score interval saying their fathers wanted them to go to college. Although there was great variability in the percentages for commended students, both statistical tests were significant at the .01 level. It appears that winning the award either decreased the social support for college attendance actually

Table 33

Summary of Significance Tests for Regression-Discontinuity Analysis Among Examinees Classified by Financial Resources and Ability Level

Measure of effect upon examinee and his associates (percentage of students reporting given behavior or outcome)	Measures on which Letter of Commendation had no effect (0), a significant positive effect (+) or a significant negative effect (-), as judged by Mood test (I) or covariance analysis (II)*									
	LR		HR		LA		HA		Total	
	I	II	I	II	I	II	I	II	I	II
Ability to finance college costs										
Holding a freshman scholarship (59)	0	0	+[c]	+[c]	+[c]	+[c]	0	0	+[c]	0
Holding a college or university scholarship (60)	0	0	0	+[a]	+[c]	+[c]	0	0	+[a]	0
Holding a freshman scholarship of $150 or more (61)	0	0	+[c]	+[c]	+[c]	+[c]	+[a]	0	+[c]	+[c]
Receiving one or more offers of scholarship aid (29)	0	0	+[c]	+[c]	+[c]	+[c]	0	0	+[c]	0
Instrumental behaviors										
Making two or more applications for scholarships (item 27)	0	0	0	0	+[b]	+[c]	0	0	+[b]	0
Ability to gain admission to preferred college										
Who were accepted for admission to preferred college (25)	0	0	0	0	0	0	0	0	0	0
Perceptions of others' attitudes										
Whose father encouraged college attendance (46)	0	0	0	0	0	0	0	0	-[c]	-[c]
Whose mother encouraged college attendance (47)	0	0	0	0	0	0	0	0	0	0
Receiving encouragement from teachers and guidance counselors to attend college (43)	0	0	0	0	0	0	0	0	0	0
Educational motivation										
Enrolling in college as a full-time student (8)	0	0	0	0	0	0	0	0	0	0
Planning to seek graduate or advanced professional training (7)	0	0	0	0	0	0	0	0	0	0
Reporting they placed greater value upon intellectual achievement following participation in NMSQT (37)	0	0	0	0	0	0	0	0	0	0

*Subgroups were as follows: low financial resources (LR), high financial resources (HR), low ability (LA), and high ability (HA).

[a] p .05 (two-tailed test)

[b] p .02 (two-tailed test)

[c] p .01 (two-tailed test)

received from the father, or decreased the extent to which the student believed his father wanted him to go to college. Possibly the commended student who does not enroll in college or who enrolls in a non-preferred institution, feels--as a result of the award--that he deserves a better fate, and blames his father for not having given him more social and financial support. In any case, these effects seem relatively weak, since when smaller groups are considered in the breakdowns no effects appear.

To summarize, the Letter of Commendation increased the likelihood that the recipient would win a scholarship or a scholarship offer. These effects occurred primarily among students with high financial resources or from states with relatively low qualifying scores. The only other effects were to increase the degree to which the latter applied for scholarships, and possibly to raise doubts in some students' minds about the extent to which their fathers really wanted them to go to college. The award clearly affected only one of the four dispositions hypothesized to be related to motivation for advanced training, and the effects for the one it did affect (ability to pay college costs) were found primarily among those who were already relatively well-to-do. From this outcome we would predict relatively little effects upon the educational motivation of these students, and none were found.

Effects of the Certificate of Merit Award

[illegible] test of the effects of C of M awards given in an earlier Merit program.[5] In this

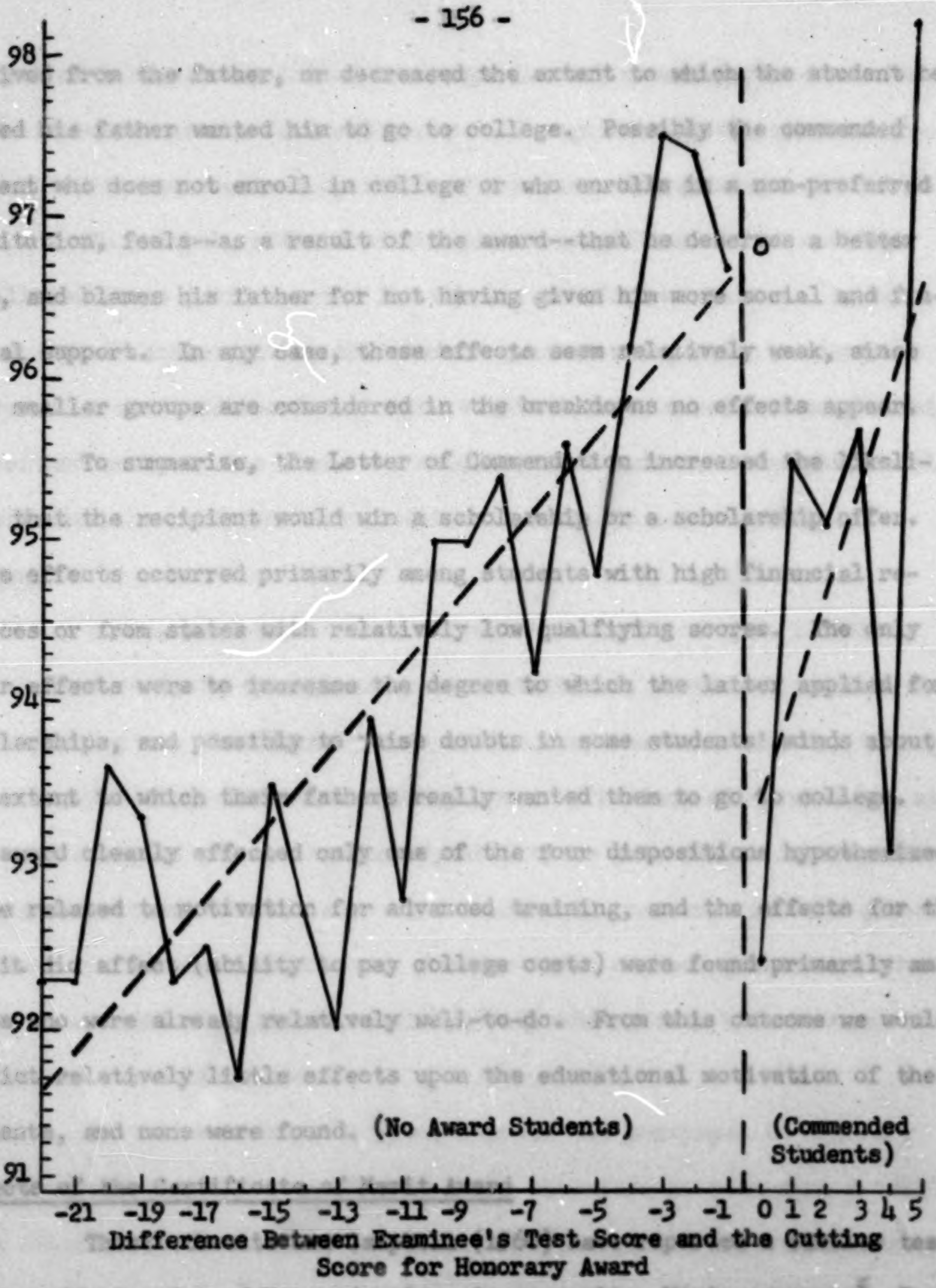

Figure 14 Regression of Perception of Father's Attitude Toward College on Exposure Determiner

received from the father, or decreased the extent to which the student believed his father wanted him to go to college. Possibly the commended student who does not enroll in college or who enrolls in a non-preferred institution, feels--as a result of the award--that he deserves a better fate, and blames his father for not having given him more social and financial support. In any case, these effects seem relatively weak, since when smaller groups are considered in the breakdowns no effects appear.

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[5] A second [illegible] analysis was made comparing commended students and C of M winners in the present sample. However, questionnaires were available from only about half as many C of M winners as were studied by Thistlethwaite and Campbell (1960); consequently the results based upon the larger sample of subjects are summarized here.

To summarize, the Letter of Commendation increased the likelihood that the recipient would win a scholarship or a scholarship offer. These effects occurred primarily among students with high financial resources or from states with relatively low qualfiying scores. The only other effects were to increase the degree to which the latter applied for scholarships, and possibly to raise doubts in some students' minds about the extent to which their fathers really wanted them to go to college. The award clearly affected only one of the four dispositions hypothesized to be related to motivation for advanced training, and the effects for the one it did affect (ability to pay college costs) were found primarily among those who were already relatively well-to-do. From this outcome we would predict relatively little effects upon the educational motivation of these students, and none were found.

Effects of the Certificate of Merit Award

Thistlethwaite and Campbell (1960) have reported a similar test of the effects of C of M awards given in an earlier Merit program.[5] In this study C of M winners comprised the "experimental group" while commended students served as the "control group." Though both groups received recognition the amount received by the C of M winners was greater.

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[5] A second regression-discontinuity analysis was made comparing commended students and C of M winners in the present sample. However, questionnaires were available from only about half as many C of M winners as were studied by Thistlethwaite and Campbell (1960); consequently the results based upon the larger sample of subjects are summarized here.

In general, effects of the added recognition almost exactly paralleled those just reported for the Letter of Commendation. In both cases, the treatment giving the student greater recognition produced an increase in the likelihood that the recipient would receive a scholarship. In neither analysis was there any evidence that increased recognition clearly affected the recipient's motivation to seek advanced training.

Summary

A theory of the effects of social recognition upon the plans of talented students to seek advanced training was previously derived from retrospective reports of recipients of honorary awards in the Merit program. These reports suggested that honorary awards affected self-evaluative attitudes, ability to pay college costs, ability to gain admission to preferred colleges, perceived social support for advanced training, and the educational plans of recipients. However, further tests of these causal hypotheses using a new mode of analysis confirmed only the effects upon changes in ability to pay college costs.

In the new analysis, group exposed and unexposed to honorary awards were segregated according to their closeness to receiving a treatment other than the one they had received. Background traits correlated with the probability of exposure to recognition (e.g., rank in high school, etc.) presumably vary systematically with the score intervals which represent the student's nearness to the qualifying score for recognition. All of these traits contribute to the observed slopes of the regression lines plotted in Figures 11-14. Since there is no reason to believe that the composite effect of all relevant background traits fluctuates markedly at the cutting point, regression discontinuities emerging the point where awards were introduced must be attributable to the special experimental treatment--the only factor which assumes an abrupt change in value in this region. Thus the new analysis seems to provide a persuasive test of the presence or absence of experimental effects. Presumably the earlier analyses based upon retrospective appraisals of winning honorary awards were confounded with responses biases or other sources of invalidity.

While the Letter of Commendation and the Certificate of Merit award do increase the likelihood that the recipient will win a scholarship, it is primarily the relatively well-to-do student who benefits in this respect. Consequently these results suggest that individual honorary awards have very limited value as incentives for recruiting students into college or for increasing their desire for advanced training.

Chapter 9

DISTRIBUTION OF TALENT IN SPECIALIZED FIELDS

A question of concern to every intellectual discipline is whether it is attracting and holding the interests of talented undergraduates. Some of the factors which presumably affect the recruitment of talent in different fields are at least partially manipulable by college teachers. Among these factors are the instructional methods commonly used by teachers in the field of study, the degree to which instructional goals are viable and challenging to capable students, and the extent to which students are encouraged to discover how their creative and productive potentialities can find expression in the field.

In subsequent chapters we shall examine the student's perception of his college teachers and student colleagues during the early college years. However, before considering the images which college teachers present to their students and what changes in these images might result in a better utilization and development of talent, it is useful to inquire into the characteristics of students initially attracted to each of the specialized fields. The present chapter describes some of the differences in the intellectual abilities, educational aspirations, and value orientations of students entering different fields.

Other factors which may affect the recruitment of talent in different fields of specialization are presumably manipulable by college administrators and scholarship-granting agencies. We have seen in Chapter 6 that almost a third of the scholarship awards to Merit examinees went to students planning to major in one of the physical sciences. Further, scholarship-granting agencies which give the largest stipends (namely, federal governmental agencies, business and industry, and scholarship foundations) tend to give even greater proportions of their awards to physical science majors. In this chapter we shall describe the results of an analysis made to determine whether students planning to enter certain fields of study are subsidized more often than we would expect on the basis of their relative aptitudes and instrumental behaviors in seeking aid.

Popularities of Fields of Specialization at the Beginning of College

Engineering and education claim the greatest allegiance among qualified Merit examinees at the start of college. Together these two fields are chosen by over a quarter (28 per cent) of all examinees included in this study. As Table 34 shows, 29 per cent of the men planned to major in engineering and 24 per cent of the women planned to major in courses preparing them for elementary or secondary school teaching. Among men the most popular major fields of study were in order: engineering, pre-medical studies, chemistry, business and commerce, and mathematics. The five fields ranking highest in popularity accounted for over half (53.6 per cent) of the major field choices of men. Among women, the most popular fields were: education, English, health professions, biological sciences, and mathematics. The five most popular fields among women accounted for slightly less than half (48.2 per cent) of all choices.

It is apparent from Table 34 that some fields of specialization, such as home economics, are perceived as "women's fields," while

Table 34

Probable Major Field of Study Reported at the Beginning of College by College Entrants

Probable major field of study[1]	Per cent planning to major in given field			Per cent of students with given major plans who are male
	Women (N=9,957)	Men (N=11,821)	Total (N=21,778)	
Physical Sciences				
Engineering	.4	28.7	3,437	98.7
Mathematics	5.2	5.7	1,191	56.6
Chemistry	3.3	6.1	1,050	68.5
Physics	.6	4.5	588	90.6
Social Sciences				
Elem. & Second. Educ.	24.2	2.5	2,705	11.0
History	2.8	2.3	552	48.9
Psychology	3.4	1.2	487	29.6
Economics	.5	3.4	440	89.3
Pol. Sci. & Gov't	1.1	1.4	278	59.7
Sociology	2.3	.3	263	14.0
Biological Sciences				
Pre-medical	2.5	7.1	1,089	77.3
Biological Sciences	5.4	3.3	926	42.0
Health professions[2]	5.7	1.2	706	20.1
Pre-dental	.1	1.8	217	94.0
Arts & Humanities				
English	7.7	2.1	1,015	24.3
Modern For. Lang.	4.8	.6	543	12.5
Fine & Applied Arts	3.6	.6	433	16.4
Music	2.9	1.1	420	30.7
Architecture	.2	1.7	214	91.6
Speech	1.3	.2	150	14.0
Misc. Fields				
Business & Commerce	4.8	6.0	1,189	59.9
Pre-law	.3	4.0	510	93.1
Home economics	4.3	----	433	.5
Journ. & Advertising	1.6	1.0	279	43.4
Religion	.7	1.0	192	62.5
Physical Education	1.1	.7	189	44.4
Agriculture	.1	.8	104	93.3
Other Fields Not Specified Above	1.9	4.0	664	----
Major Fields Not Identified (undecided or no response)	7.2	6.7	1,514	----
TOTALS	100.0	100.0	21,778	

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[1] Only fields selected by at least 100 examinees are listed.

[2] Includes nursing or medical technology.

others, such as engineering, pre-dentistry, pre-law, agriculture, architecture, and physics are perceived as "men's fields." In engineering the ratio of men to women was 79 to 1, while in home economics the ratio of women to men was 215 to 1. On the other hand, some fields such as mathematics, history, political science and government, which have traditionally been seen as masculine fields, at least start with sizeable numbers of women. Women are, of course, less likely than men to seek advanced professional or graduate training. Hence the fields with large ratios of men to women have the advantage of attracting larger proportions of students who are likely to be susceptible to encouragement to seek advanced training.

Intellectual Ability of Students Choosing Different Fields

One way of illustrating differences in talent supply between different fields of study is to calculate percentile equivalents for NMSQT scores relative to all Merit examinees selecting a given major field of study. Figure 15 shows the 10th, 25th, 50th, 75th, and 90th percentiles for students selecting each field as their probable major field of study.[1] It can be seen that physics attracts an extraordinarily talented group of students. Over 75 per cent of the physics majors had aptitude scores higher than the average score of engineering majors, and 90 per cent had higher scores than the average score of physical education majors.

While the differences in aptitude scores between physics majors and other majors are striking, Figure 15 also shows that there is much overlapping from one field to another. Even in such a selective field

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[1] Percentile scores are given in tabular form in Table D-1 of Appendix D.

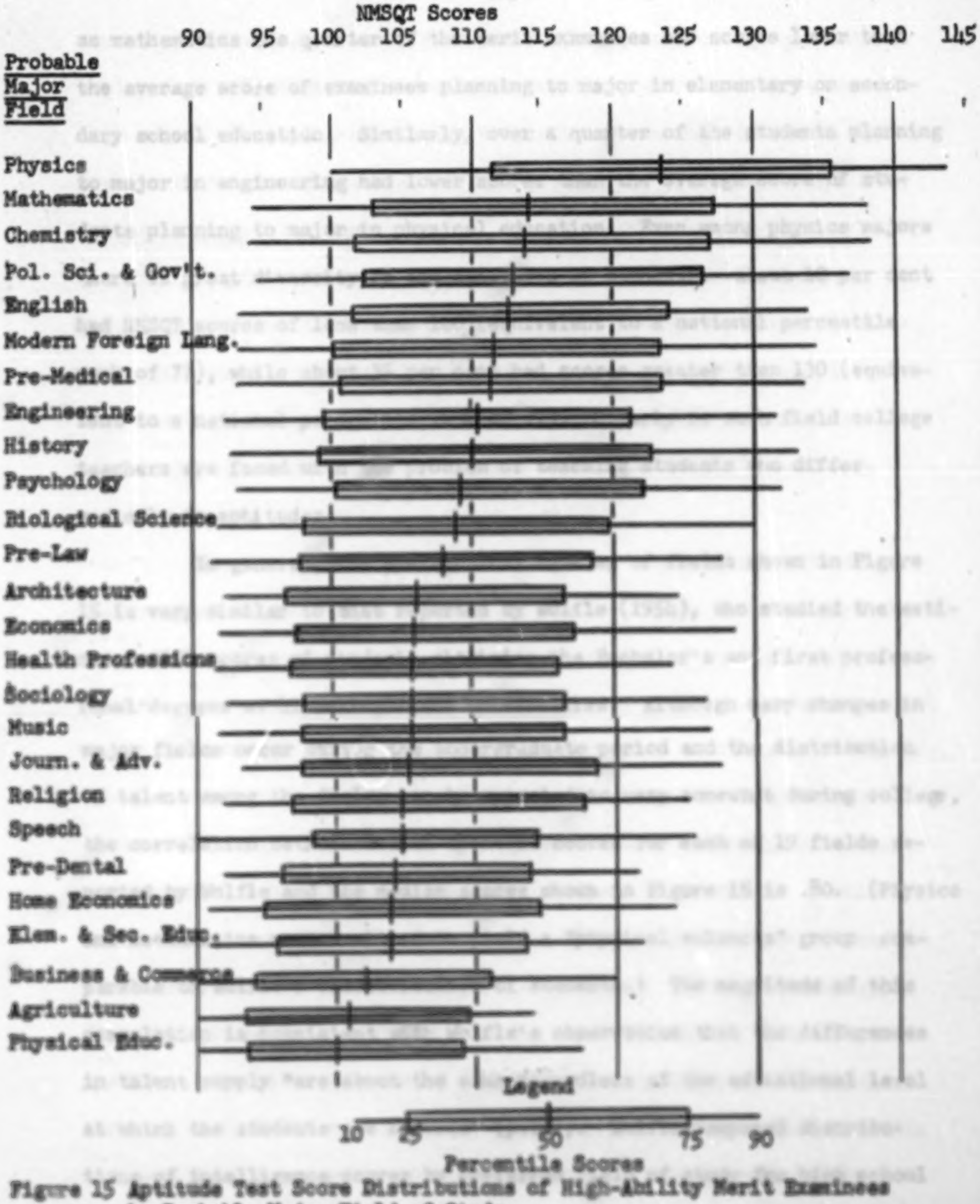

Figure 15 Aptitude Test Score Distributions of High-Ability Merit Examinees by Probable Major Field of Study

as mathematics one quarter of the Merit examinees had scores lower than the average score of examinees planning to major in elementary or secondary school education. Similarly, over a quarter of the students planning to major in engineering had lower scores than the average score of students planning to major in physical education. Even among physics majors there is great diversity in the aptitudes of students: about 10 per cent had NMSQT scores of less than 100 (equivalent to a national percentile rank of 77), while about 35 per cent had scores greater than 130 (equivalent to a national percentile rank of 97). Clearly in each field college teachers are faced with the problem of teaching students who differ markedly in aptitudes.

In general, the hierarchical ranking of fields shown in Figure 15 is very similar to that reported by Wolfle (1954), who studied the estimated AGCT scores of students obtaining the Bachelor's and first professional degrees at 41 colleges and universities. Although many changes in major fields occur during the undergraduate period and the distribution of talent among the fields can be expected to vary somewhat during college, the correlation between median aptitude scores for each of 19 fields reported by Wolfle and the median scores shown in Figure 15 is .80. (Physics and mathematics were combined to yield a "physical sciences" group comparable to Wolfle's classification of students.) The magnitude of this correlation is consistent with Wolfle's observation that the differences in talent supply "are about the same regardless of the educational level at which the students are studied" (p.197). Wolfle compared distributions of intelligence scores by preferred field of study for high school students, college graduates, graduate students, and college graduates employed in different fields of specialization, and found there was a high degree of consistency in the hierarchical rankings of fields by average mental test scores at different stages of training.

Scholarships and the Recruitment of Talent in Different Fields

Scholarships offered by many corporations and businesses, P.T.A. Groups, and the Naval R.O.T.C. are frequently earmarked for students with particular career interests. Consequently it is possible that the distribution of talent among different fields of specialization is partly shaped by the available opportunities for scholarship aid.

One way of gaining information about the possible effects of differential subsidization of study in various fields is to compare the major field choices of scholarship recipients and of students who do not hold scholarships. In Table 35 fields have been ordered with respect to the percentages of majors in each field holding scholarships. Physics, music, mathematics, and chemistry had the largest proportions of male students holding scholarships, while pre-dentistry, economics, business and commerce, and architecture had the smallest proportions. Similarly, music, chemistry, and mathematics had the largest proportions of female students receiving subsidization, while political science, sociology, fine and applied arts, and business and commerce had the smallest proportions. The distributions of winners and non-winners of scholarships choosing each field were compared by Chi-square analyses and the results indicate that there are highly significant differences in the field

Table 35

Probable Major Field of Study Among Winners and Non-Winners of Freshman Scholarships

Probable major field of study*	Per cent planning to major in each field among: Scholarship recipients	Students without scholarships	Per cent of students with major plans holding freshman scholarships
I. Men	(N=3,521)	(N=8,300)	
Physics	7.2	3.4	47.5
Music	1.7	.8	45.7
Mathematics	8.0	4.7	41.8
Chemistry	8.0	5.3	39.2
Religion	1.2	.9	36.7
Elem. and Second. Educ.	2.8	2.4	32.9
Psychology	1.3	1.2	31.3
Pre-medical	7.3	7.1	30.4
English	2.1	2.1	30.0
History	2.3	2.3	30.0
Engineering	27.9	29.1	28.9
Pol. Sci. & Gov't.	1.3	1.4	27.7
Biological Sciences	2.9	3.5	26.2
Health Professions	1.1	1.3	26.1
Journ. & Advertising	.8	1.1	24.0
Pre-law	3.2	4.3	24.0
Architecture	1.2	1.8	20.9
Business and Commerce	4.1	6.8	20.2
Economics	2.2	3.8	20.1
Pre-dental	1.1	2.0	19.6
Other fields not classified above	6.7	7.5	27.6
Major field not identified (Undecided or no response)	5.6	7.2	24.7
TOTALS (MEN)	100.0	100.0	29.8
II. Women	(N=3,457)	(N=6,500)	
Music	4.7	2.0	56.0
Chemistry	4.7	2.6	49.5

Table 35 (Cont'd)

Probable major field of study	Per cent planning to major in each field among: Scholarship recipients	Students without scholarships	Per cent of students with major plans holding freshman scholarships
	II. Women		
	(N=3,457)	(N=6,500)	
Mathematics	6.7	4.4	44.9
History	3.2	2.7	38.7
Home economics	4.8	4.1	38.3
English	8.2	7.4	37.0
Pre-medical	2.6	2.4	36.0
Elem. and Second. Educ.	24.9	23.8	35.7
Biological Sciences	5.3	5.5	34.1
Modern For. Lang.	4.5	4.9	32.8
Health Professions	5.2	5.9	32.1
Journ. & Advertising	1.3	1.7	29.1
Speech	1.1	1.4	28.7
Physical Education	.8	1.2	27.6
Psychology	2.7	3.8	27.4
Business and Commerce	3.4	5.5	24.7
Fine and Applied Arts	2.6	4.2	24.3
Sociology	1.5	2.7	22.6
Pol. Sci. and Gov't.	.7	1.3	22.3
Other fields not classified above	5.2	4.6	37.8
Major field not identified (undecided or no response)	5.9	7.9	28.4
TOTALS (WOMEN)	100.0	100.0	34.7

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*Fields are listed in order of the percentage of students with given expectations holding freshman scholarships.

choices of the two groups, both among men and women (chi-square values of 281 for 21 df and of 220 for 20 df, respectively).

To be sure, differences in intellectual ability among students attracted into different fields of study (Figure 15) would almost certainly lead us to predict that physics majors will win scholarships more frequently than other students, particularly in view of the relationship between aptitude test scores and success in winning scholarships discussed in Chapter 6. Perhaps the best way of studying whether a field enjoys more than its "fair share" of subsidization is to compare success in winning scholarships by major field of study among students who present similar academic qualifications.

We have seen in Table 18 that success in winning one or more scholarship offers was most highly related to the number of applications made, percentile rank in high school graduating class, and aptitude test score. In order to interpret the evidence of differential subsidization shown in Table 35 it is desirable to compare success in winning aid in each field when we control for differences in relevant student traits. A simple way of doing this is to compare the residuals for each field of study in predicting the percentage holding scholarships from student background traits.

Figure 16 and 17 present scatter-plots for men and women, respectively, showing the least squares linear line of regression of success in winning scholarships upon an index of student intellectual ability. The residuals for each field (difference between observed success and predicted success) can be judged by the vertical deviation of each field's plot from the regression line. To illustrate the method, the observed (Y_M) and predicted ($\hat{Y}_M$) success in winning of scholarships among men planning to enroll in music are plotted in Figure 16. In both figures 16 and 17 the largest residuals ($\hat{Y}_M$-Y_M) were found for music majors.

Table 36 summarizes results of regression analyses in which aptitude test scores, rank in high school graduating class, and number of scholarship applications were separately controlled. It can be seen that among men, majors in music, religion, mathematics, and physics consistently received scholarships more often than we would predict on the basis of these three background traits. Do majors in these fields receive more than their "fair share" of subsidization? We cannot assume that aptitude test scores or ranks in high school graduating class are equally good predictors of future accomplishment in all fields. On the contrary, we might expect such scores and ranks to be poor predictors of musical ability or of aptitude for religious training. Consequently, the unexpected success of these majors in obtaining financial aid could mean that other student characteristics were considered by scholarship donors in deciding which of these student merited aid.

The percentage of students in different fields receiving scholarships can be predicted with surprising accuracy by the percentage of students making two or more scholarship applications. For women the correlation is .95, and for men it is .89. Thus 90 per cent of the variation between fields in the proportion of women holding scholarships can be accounted for by student initiative in applying for aid. Similar-

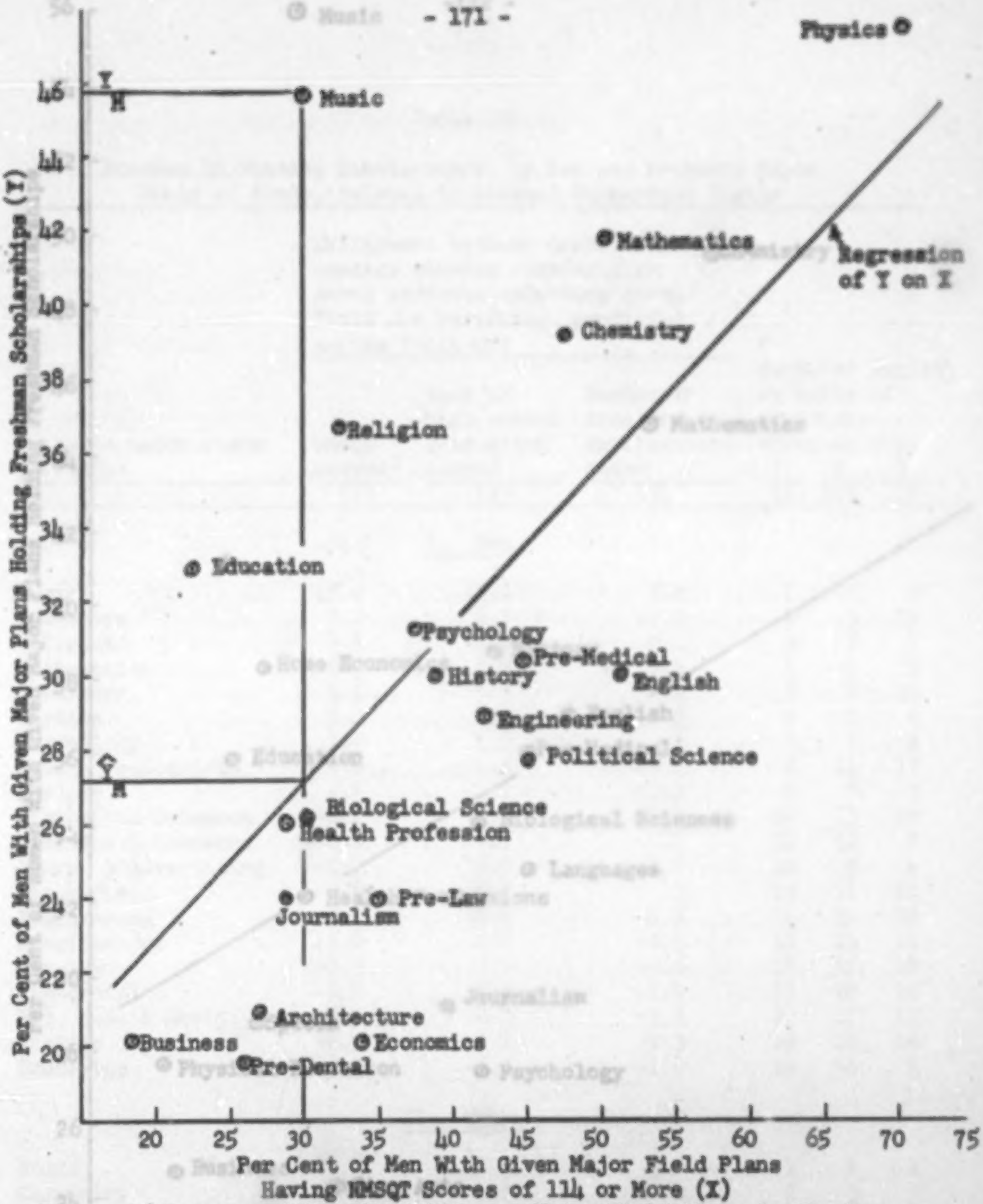

Figure 16 Success of Men with Different Major Field Plans in Winning Scholarships With Aptitude Test Scores Controlled

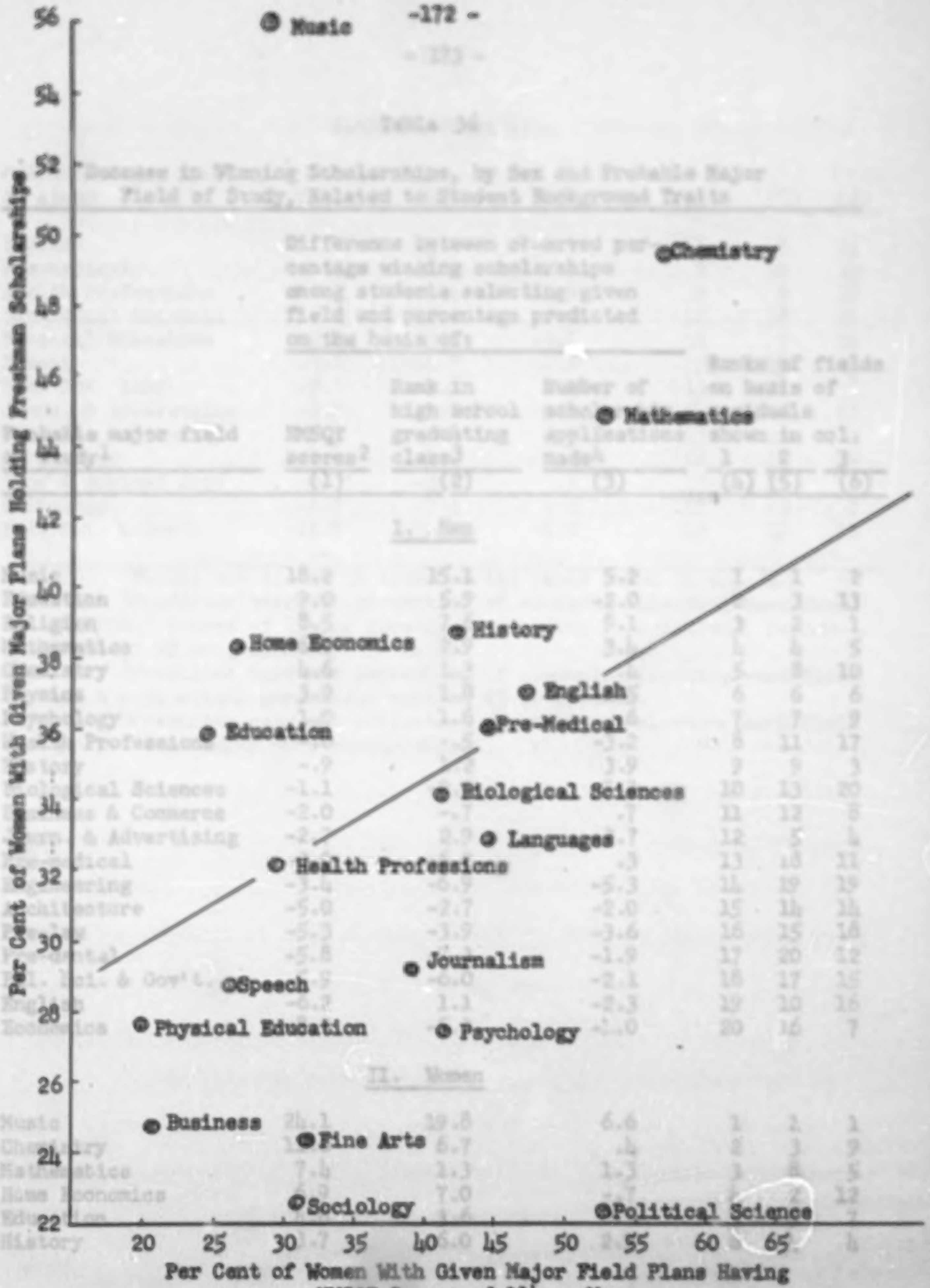

Figure 17 Success of Women With Different Major Field Plans In Winning Scholarships With Aptitude Test Scores Controlled

Table 36

Success in Winning Scholarships, by Sex and Probable Major Field of Study, Related to Student Background Traits

	Difference between observed percentage winning scholarships among students selecting given field and percentage predicted on the basis of:			Ranks of fields on basis of residuals shown in col.		
Probable major field of study[1]	NMSQT scores[2] (1)	Rank in high school graduating class[3] (2)	Number of scholarship applications made[4] (3)	1 (4)	2 (5)	3 (6)
		I. Men				
Music	18.2	15.1	5.2	1	1	2
Education	9.0	5.9	-2.0	2	3	13
Religion	8.5	7.6	9.1	3	2	1
Mathematics	6.0	2.9	3.4	4	4	5
Chemistry	4.6	1.3	.4	5	8	10
Physics	3.2	1.8	1.5	6	6	6
Psychology	1.0	1.6	.6	7	7	9
Health Professions	-.6	-.5	-3.2	8	11	17
History	-.9	1.2	3.9	9	9	3
Biological Sciences	-1.1	-2.0	-7.3	10	13	20
Business & Commerce	-2.0	-.7	.7	11	12	8
Journ. & Advertising	-2.7	2.9	3.7	12	5	4
Pre-medical	-3.0	-6.2	.3	13	18	11
Engineering	-3.4	-6.9	-5.3	14	19	19
Architecture	-5.0	-2.7	-2.0	15	14	14
Pre-law	-5.3	-3.9	-3.6	16	15	18
Pre-dental	-5.8	-7.3	-1.9	17	20	12
Pol. Sci. & Gov't.	-5.9	-6.0	-2.1	18	17	15
English	-6.2	1.1	-2.3	19	10	16
Economics	-8.7	-5.3	-1.0	20	16	7
		II. Women				
Music	24.1	19.8	6.6	1	1	1
Chemistry	11.0	6.7	.4	2	3	9
Mathematics	7.4	1.3	1.3	3	8	5
Home Economics	6.9	7.0	-.7	4	2	12
Education	4.8	3.6	.7	5	5	7
History	3.7	6.0	2.9	6	4	4

Table 36 (Cont'd)

Probable major field of study	(1)	(2)	(3)	(4)	(5)	(6)
English	.8	3.6	-.4	7	6	11
Pre-medical	.5	-1.9	-.3	8	12	10
Health Professions	.1	.2	-3.9	9	9	18
Biological Sciences	-.7	-8.6	-5.6	10	18	19
Physical Education	-2.2	3.0	-2.9	11	7	16
Speech	-2.6	-4.7	-.8	12	15	13
Mod. For. Lang.	-2.7	-7.7	.5	13	17	8
Journ. & Advertising	-5.2	-.9	-2.9	14	10	17
Business & Commerce	-5.3	-6.8	3.3	15	16	3
Psychology	-7.4	-4.3	-2.4	16	14	15
Fine & Applied Arts	-8.2	-1.8	.9	17	11	6
Sociology	-9.8	-3.4	4.6	18	13	2
Pol. Sci. & Gov't.	-15.1	-11.2	-1.2	19	19	14

[1] Fields are listed in order of the ranks shown in col. 4.

[2] Predictor used was percentage of students selecting each field who had NMSQT scores of 114 or greater (equivalent to a national percentile rank of 90 or greater).

[3] Predictor used was percentage of students selecting each field who had a high school percentile rank of 85 or greater.

[4] Predictor used was percentage of students selecting each field who applied for two or more scholarships.

ly, about 80 per cent of the variation between fields in the proportion of men holding scholarships can be accounted for by the student initiative variable. Correlations of the percentage of majors in a given field holding scholarships and the average aptitude test scores or average rank in high school class for these students are considerably lower: for women, the r's are .29 and .62, respectively; for men, they are .62 and .75 respectively. Students in some fields are subsidized somewhat more frequently than we would predict on the basis of the field's talent supply (as measured by high school rank and mental test scores) but it appears that these inequalities may be largely the result of variations in student initiative. Thus, 80 per cent of the men entering physics applied for two or more scholarships while only 43 per cent of the men entering economics made two or more scholarship applications.

To summarize, there is evidence that fields of study differ with respect to the intellectual ability of the students they attract, but there is little evidence that these differences are due to the greater availability of scholarship funds in some fields than in others. The remaining sections of this chapter describe additional differences among students entering different fields of specialization.

Educational Aspirations at the Beginning of College

Some students enter college planning to stay only a year or two; others enter with plans to complete M.D. or Ph.D. degrees requiring three or more years of post-graduate work. In some fields, such as physics, the Ph.D. is a minimum requirement for employment in the field, while in others, such as business and commerce, only students planning to teach in a college or university will seriously consider seeking the Ph.D. The relevance and desirability of advanced graduate or professional work will vary according to the student's field of interest. Similarly, the extent to which college teachers in different departments of a university can motivate their students to seek advanced training will depend upon the initial goals and aspirations of the students attracted to their fields.

Table 37 presents distributions of the highest level of education students planned to complete at the beginning of college. Fields have been ranked according to the percentage of men or women planning to do at least some graduate or professional study. As expected, men planning to go into medicine, dentistry, or law most frequently report plans to do post-graduate study. Presumably, the few who say they do not plan to seek advanced training have not made firm career decisions. Pre-law students appear to be less committed than pre-medical or pre-dental students to seek advanced professional training, a finding consistent with Thielens' (1957) observation that medical students more frequently make their career decisions before entering college than do law students.

The relative lack of interest of women in seeking advanced training can be seen in the total distributions for men and women in Table 37. While 55 per cent of the men planned to do some kind of post-graduate work, only 31 per cent of the women planned to enter post-graduate study.

Among other disciplines, physics and psychology tend to attract the largest percentages of men planning to seek advanced degrees, while

Table 37

Highest Level of Education Students Initially Planned to Complete, by Sex and Probable Major Field of Study

	Per cent of majors who, at the beginning of college, mentioned each level as the highest they expected to complete[b]				
Probable major field of study[a]	Some college or bachelor's degree (1)	One year of grad. or prof. study (M.A.) (2)	Obtain prof. degree (M.D., D.D.S., etc.) (3)	Obtain Ph.D. or Ed.D. degree (4)	Total--per cent planning grad. or prof. study (5)
		I. Men			
Pre-dental (204)	----	.5	98.5	.5	99.5
Pre-medical (842)	2.5	.8	94.2	2.5	97.5
Pre-law (475)	12.4	10.5	72.0	3.4	85.9
Physics (533)	19.5	23.4	5.3	50.5	79.2
Psychology (144)	22.9	17.4	27.1	32.6	77.1
Biol. Sciences (389)	24.7	20.1	41.9	13.3	75.3
Pol. science or gov't. (166)	27.7	22.3	34.9	14.5	71.7
Chemistry (719)	30.6	25.4	15.3	28.1	68.8
History (270)	34.1	21.9	20.4	23.3	65.6
Religion (120)	30.0	19.2	30.8	15.0	65.0
English (247)	33.6	30.4	15.8	18.6	64.8
Music (129)	39.5	33.3	4.7	22.5	60.5
Mathematics (674)	38.1	31.8	5.5	23.0	60.3
Elem. or second. educ. (298)	47.7	33.2	1.3	16.8	51.3
Health professions (142)	50.7	10.6	37.3	.7	48.6
Architecture (196)	52.1	32.6	11.2	3.6	47.4
Engineering (3,394)	57.2	27.3	6.6	7.8	41.7
Economics (393)	64.4	25.7	6.6	2.5	34.8
Journ. & Advertising (121)	66.1	27.3	3.3	2.5	33.1
Business & Commerce (712)	76.5	14.8	5.8	1.8	22.4
All other fields (1,653)	55.9	20.6	9.7	11.7	42.0
TOTAL (MEN) (11,821)	43.6	22.0	20.7	12.6	55.3

Table 37 (Cont'd)

Probable major field of study	(1)	(2)	(3)	(4)	(5)
		II. Women			
Pre-medical (247)	25.1	4.9	67.6	1.6	74.1
Psychology (343)	53.6	31.8	3.5	9.9	45.2
Chemistry (331)	55.8	25.1	7.3	11.2	43.6
Pol. Science & Gov't. (112)	57.2	32.1	6.2	4.5	42.8
Sociology (226)	57.6	35.8	3.5	2.2	41.5
Mathematics (517)	59.9	33.1	1.0	5.6	39.7
History (282)	59.2	32.6	1.8	5.3	39.7
English (768)	60.6	31.7	1.4	5.6	38.7
Music (291)	61.9	32.6	2.4	2.4	37.4
Mod. for. lang. (475)	62.1	28.8	1.1	6.9	36.8
Biological sciences (537)	64.1	19.9	10.2	5.0	35.1
Speech (129)	69.0	22.5	2.3	5.4	30.2
Physical education (105)	72.4	21.9	.9	4.8	27.6
Elem. & second. educ. (2,467)	73.1	20.9	1.1	3.6	25.6
Fine and applied arts (362)	75.7	20.7	1.7	1.7	24.1
Journ. & advertising (158)	80.4	15.8	---	3.8	19.6
Health professions (564)	79.3	8.9	9.0	.5	18.4
Home economics (431)	82.2	15.3	.7	1.1	17.1
Business & Commerce (477)	95.5	2.3	.6	.8	3.7
All other fields (1,195)	68.3	20.1	4.0	6.2	30.3
TOTAL (WOMEN) (9,957)	68.1	22.0	4.5	4.4	30.9
GRAND TOTAL (21,778)	54.8	22.0	13.3	8.8	44.1

[a] N's for percentages are shown in parentheses.

[b] Percentages for cols 1-4 do not add to 100 for some fields because of non-response to the question concerning degree aspirations.

psychology and chemistry attract the largest percentages of women aspiring to obtain graduate or professional degrees. Men and women planning to major in business and commerce least frequently planned to do graduate work. Differences between fields in the percentages of men planning to seek the Ph.D. degree or its equivalent are particularly marked. Among men the range is from 50.5 per cent for physics to less than one per cent for the health professions; among women the range is from 11.2 per cent for chemistry to less than one per cent for business and commerce.

Value Orientations of Students

The reasons students give for their college choices may be considered as indicants of their value orientations. Thus a student who says the most important considerations for him were the high prestige of the college and the small size of the student body can be inferred to have somewhat different values than the student who says the most important considerations were the high educational standards and course of study offered by the institution. Although reasons for college choice do not permit us to identify with great precision the values of students selecting various major fields of study, they nonetheless suggest differences in value orientation which may affect persistence in college.

The most frequently mentioned reasons for college choice were "high educational standards" (52 per cent), "course of study offered" (36 per cent), "low tuition costs and living expenses" (30 per cent), and "closeness to home" (20 per cent). In general, men and women did not differ with respect to the weight they gave each consideration in choosing a college.

However, both men and women in different fields of study vary greatly in their reasons for college choice. Fields have been ranked in Table 38 according to the frequency with which majors in each field said "high educational standards" were among the most important considerations in selecting a college. Among men, the range is from 79 per cent for economics majors to 17 per cent for students majoring in theology or religion, while among women the range is from 70 per cent for political science and government majors to 33 per cent for business and commerce majors.

Variations in the frequency with which other reasons are cited by the various groups suggest additional differences in value orientations. For example, men planning to major in economics place unusually great importance upon the prestige and size of the college. Men attracted into elementary or secondary school teaching consider tuition costs and living expenses to be the most important consideration in their college choices. Sixty-three per cent of the men planning to major in religion mentioned the religious character of the college as a reason for college choice (these percentages are not shown in Table 38 since other students checked this reason infrequently). In addition, majors in religion attached great importance to the course of study offered, but give minimal weight to the prestige, size, costs, proximity, or educational standards of the institution.

Among women planning to major in political science and government educational standards are major, while costs and proximity are minor, considerations. Sociology tends to attract women who have unusually

Table 38

Value Orientations as Revealed by Reasons for College Choice Among Students Entering Different Major Fields of Study

Probable Major Field of Study*	Per cent giving each response to question about the two most important considerations in deciding which school to attend					
	high educational standards (1)	course of study offered (2)	low tuition costs and living expenses (3)	closeness to home (4)	small size of student body (5)	high prestige of college (6)
		I. Men				
Economics	79	35	33	30	24	22
Pre-medical	68	34	23	15	13	16
Physics	65	34	30	12	9	13
English	61	24	23	21	17	13
Pre-law	60	29	28	20	11	14
Pol. Sci. & Gov't.	60	28	25	15	19	16
History	56	25	28	17	16	14
Chemistry	55	34	31	20	14	12
Engineering	54	44	31	21	7	12
Pre-dental	53	39	29	30	10	11
Psychology	52	16	27	15	14	13
Mathematics	51	24	31	23	14	11
Biological Sciences	50	40	33	18	15	12
Architecture	47	58	28	17	6	11
Music	47	47	26	16	9	9
Business & Commerce	41	32	33	27	12	10
Health Professions	39	68	32	20	1	8
Journ. & Advertising	38	39	29	27	9	11
Elem. & Second. Educ.	36	27	43	21	12	7
Religion	17	53	15	8	6	3
Other unclassified fields	40	45	29	20	11	13
Fields not specified	49	15	26	19	14	13
TOTAL (MEN)	52	36	29	20	11	12

Table 38 (Cont'd)

Probable Major Field of Study	(1)	(2)	(3)	(4)	(5)	(6)
			II. Women			
Pol. Sci. & Gov't.	70	35	15	12	13	9
Psychology	66	31	24	16	18	13
Pre-medical	64	41	27	18	9	9
English	51	26	29	18	15	12
Mod. Foreign Lang.	60	31	24	18	17	12
Chemistry	60	36	32	18	10	7
History	57	26	25	20	21	8
Mathematics	57	26	34	19	14	11
Biological Sciences	56	42	31	16	15	9
Sociology	54	25	27	16	20	7
Speech	51	53	30	16	11	9
Health Professions	49	62	29	18	6	8
Journ. & Advertising	46	[illegible]	34	20	8	10
Elem. & Second. Educ.	46	32	37	26	14	7
Music	45	51	27	14	11	6
Fine & Applied Arts	45	53	24	21	11	11
Home economics	44	55	32	20	10	9
Physical Education	38	57	36	17	18	3
Business & Commerce	33	44	33	32	12	8
Other unclassified fields	51	39	29	13	12	9
Fields not specified	51	17	25	20	15	12
TOTALS (WOMEN)	51	36	31	20	13	9
GRAND TOTAL (MEN & WOMEN)	52	36	30	20	12	11

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*Fields are listed in order of the percentage checking "high educational standards." In cols. 1-6 the highest and lowest percentages are underlined. N's on which percentages are based are the same as those listed in Table 37.

strong religious orientations but who place unusually little weight on the course of study offered by their institution. Like men, women entering education attach great importance to cost considerations. The vocational orientation of women entering nursing training (health professions) is indicated by the importance they give to the course of study offered by their school.

Definiteness of Vocational Plans and Initial Major Field of Study

Presumably students who have made little progress in selecting a future occupation will exhibit relatively frequent shifts in their choice of a major field of study while in college. Those who believe they have made definite and probably final decisions about their future careers should exhibit greater stability in their choice of a major field. Since the stability of the student's major field choice probably varies with the degree of his commitment to a given career, we may use the student's career commitment as a rough indication of the degree to which fields attract students who are likely to remain or withdraw from the field while in college.

In Table 39 fields have been ordered with respect to the percentage of majors who reported, during their freshman year of college, that they had made "definite and probably final decisions" in selecting their future occupation. It can be seen that women are no more undecided about their future occupations than men; if anything, women report slightly greater progress in reaching a vocational decision than men. Thus, 42 per cent of the women, and only 34.4 per cent of the men, report they have definite and probably final decisions.

Table 39

Definiteness of Vocational Plans of High-Ability Examinees at the Beginning of College, by Sex and Probable Major Field of Study

Probable Major Field of study[a]	Per cent giving each response to question about progress made in selecting future occupation[b] has made definite and probably final decision (1)	has made tentative but definite decision (2)	undecided or has made hardly any progress (3)
I. Men			
Religion	73	19	8
Health professions	68	25	8
Music	56	28	16
Pre-medical	55	29	16
Architecture	50	34	16
Pre-dental	48	36	16
Elem. & Second. Educ.	42	29	28
Biological Sciences	40	24	36
Pre-law	38	32	30
Engineering	37	32	31
Chemistry	33	33	34
Business & Commerce	30	26	43
Physics	29	34	37
Psychology	29	29	42
English	27	23	49
History	26	25	49
Journ. & Advertising	25	34	41
Pol. Sci. & Gov't.	22	30	47
Mathematics	21	25	53
Economics	17	24	59
All other fields	37	29	34
Major field not identified (undecided or no response)	7	7	84
TOTALS (MEN)	34	28	37

Table 39 (Cont'd)

Probable Major Field of Study	(1)	(2)	(3)
II. Women			
Health professions	77	18	5
Physical Education	59	26	15
Elem. & Second. Educ.	58	24	18
Business & Commerce	55	26	19
Music	54	26	19
Pre-medical	48	35	17
Home Economics	44	30	26
Speech	42	27	30
Biological Sciences	40	26	34
Journ. & Advertising	39	27	32
Fine & Applied Arts	36	32	32
Chemistry	34	37	29
History	33	32	34
English	33	28	39
Mathematics	30	28	41
Sociology	27	27	46
Mod. For. Lang.	23	28	48
Psychology	21	27	52
Pol. Sci. & Gov't.	20	34	46
All other fields	37	30	33
Major field not identified (undecided or no response)	9	7	83
TOTAL (WOMEN)	42	26	32
GRAND TOTAL (MEN & WOMEN)	38	27	35

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[a] N's for percentages are shown in Table 37.

[b] Percentages for cols. 1-3 do not add to 100 for some fields because of non-response to the question concerning vocational decisions.

Among men, those planning to major in religion or in the health professions (which include mostly pharmacy majors) are the most committed with respect to future occupational plans, while those planning to major in economics, mathematics, or in political science and government are the least committed. Among women, those planning to major in the health professions (which include mostly women in nursing courses), physical education, or in elementary or secondary school teaching are most decided about their future occupations, while those selecting political science and government, psychology, and modern foreign languages are least decided.

Summary

Ninety-three per cent of the college entrants among Merit examinees ranking in the top third of ability were able to state at the beginning of college the field of study which would probably be their major. Education (elementary or secondary school teaching) attracted almost a fourth of the women--three times as many as the next most popular field of study. Engineering attracted about 29 per cent of the men--four times as many as the next most popular field of study.

Inequalities in the talent supplies of different fields of specialization similar to those reported by Wolfle (1954) were observed, and differential subsidization was largely ruled out as an explanation for these inequalities. The physical sciences tend to attract the most talented students; physical education, agriculture, business and commerce, and education tend to attract the least talented students. Men and women planning to major in music were considerably more successful in winning scholarships than would be expected on the basis of their aptitude test scores or high school ranks, but their unexpected success can be explained largely on the basis of their initiative in applying for aid and the inappropriateness of test scores and class ranks as bases for awarding stipends to music students.

Examinees planning to major in different fields of study also varied markedly in the proportion initially disposed to seek advanced graduate or professional training, in value orientations (as expressed in reasons for college choice), and in degree of commitment to a given occupation or career.

Chapter 10

COLLEGE ENROLLMENTS OF HIGH-ABILITY STUDENTS

It is estimated that about 250,000 of the Merit examinees ranking in the upper third of the ability distribution enrolled in college immediately following graduation from high school. Since this group represents 30 per cent of the current yearly first-time enrollments in higher educational institutions, it is valuable as a source of information about the distribution of talent in undergraduate colleges. From it we can learn what kinds of colleges attract our most talented men and women and something about the factors that influenced their college choices.

What incentives are effective in motivating talented students to enroll in particular colleges and universities? If we ask these students about the most important consideration in selecting a college a majority tell us that the "high educational standards" of the institution were critical. Though it is of course difficult to know what part rationalization plays in these responses, the image or reputation of a college among students may certainly be one important class of incentives influencing college choice. Students who cite this reason as one of the most important do in fact tend to enroll in colleges which are highly selective with respect to aptitude scores.

A second class of incentives which may influence the enrollments of academically talented students consists in the strategies of the college "recruiter." Unfortunately the follow-up questionnaire did not ask for information about the frequency with which the respondent talked with college representatives before deciding where to apply for admission, whether he received one or more unsolicited scholarship offers, etc. Thus in assessing the importance of this second class of incentives it was necessary to rely upon indirect modes of analysis. As a consequence only tentative conclusions can be drawn about the relative importance of various causes producing the existing distribution of talent in undergraduate institutions.

Enrollments at Institutions Classified by Type of Control and Length of Program

The essential facts concerning differences among various "types" of colleges with respect to the enrollment of talented undergraduates may be summarized as follows: first, high-aptitude students tend to enroll in private colleges, and in four-year institutions, more frequently than low-aptitude students; second, the probability of enrolling in such institutions tends to increase fairly systematically with aptitude level; and third, the curve relating the probability of enrolling in a private college and aptitude level is positively accelerated at the upper aptitude levels.

Evidence for the first of these generalizations is presented in Figure 18. It can be seen that about 80 per cent of all first-time degree-credit students enrolled in four-year institutions in Fall, 1959, as compared with 91 per cent of the college-bound Merit examinees in our sample. Clearly high-aptitude examinees tend to enroll in four-year colleges more frequently than their low-aptitude peers. While publicly-controlled colleges enrolled 61 per cent of all new freshmen, they enrolled only about 55 per cent of the relatively high-scoring Merit examinees.

Enrollments of men and women show essentially the same relationships between aptitude level and the type of school attended. The curves shown in the upper half of Figure 19 indicate that the percentages of men and women enrolling in four-year institutions increase in a fairly linear fashion with aptitude level. However, the percentages enrolling in private colleges and universities, shown in the lower half of figure 19, increase very rapidly among examinees ranking in the upper ability levels; also there appear to be slight elevations in the curves at the lowest ability levels. The latter may simply reflect sampling variations due to reduced sample sizes at the lowest aptitude levels. These percentages are based upon reports from relatively few students and are considerably less reliable than the other percentages shown.[1]

Why is there such a large increment in the probability of enrolling in a private college as we pass from the 90-95 percentile level to the highest ability level? Among men, the percentage enrolling in private colleges increases from 46 to 59 at the two highest intervals--an increase of 13 per cent. Among women, the percentage enrolling in private colleges increases from 48 to 58 at the highest intervals--an increase of 10 per cent. These increments are clearly the largest occurring at any of the adjacent aptitude intervals shown. Two explanations emphasizing the classes of incentives discussed above may be advanced. The first, which we may call the "proselytizing" hypothesis, would explain the increment as the result of competitive bidding for outstanding students in which private colleges participate more frequently. It is possible that private colleges are more active in sending recruiters to high schools, that they more often encourage outstanding students to apply for

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[1] N's for the percentages plotted in Figures 19 and 20 may be derived from Table D-2 in Appendix D.

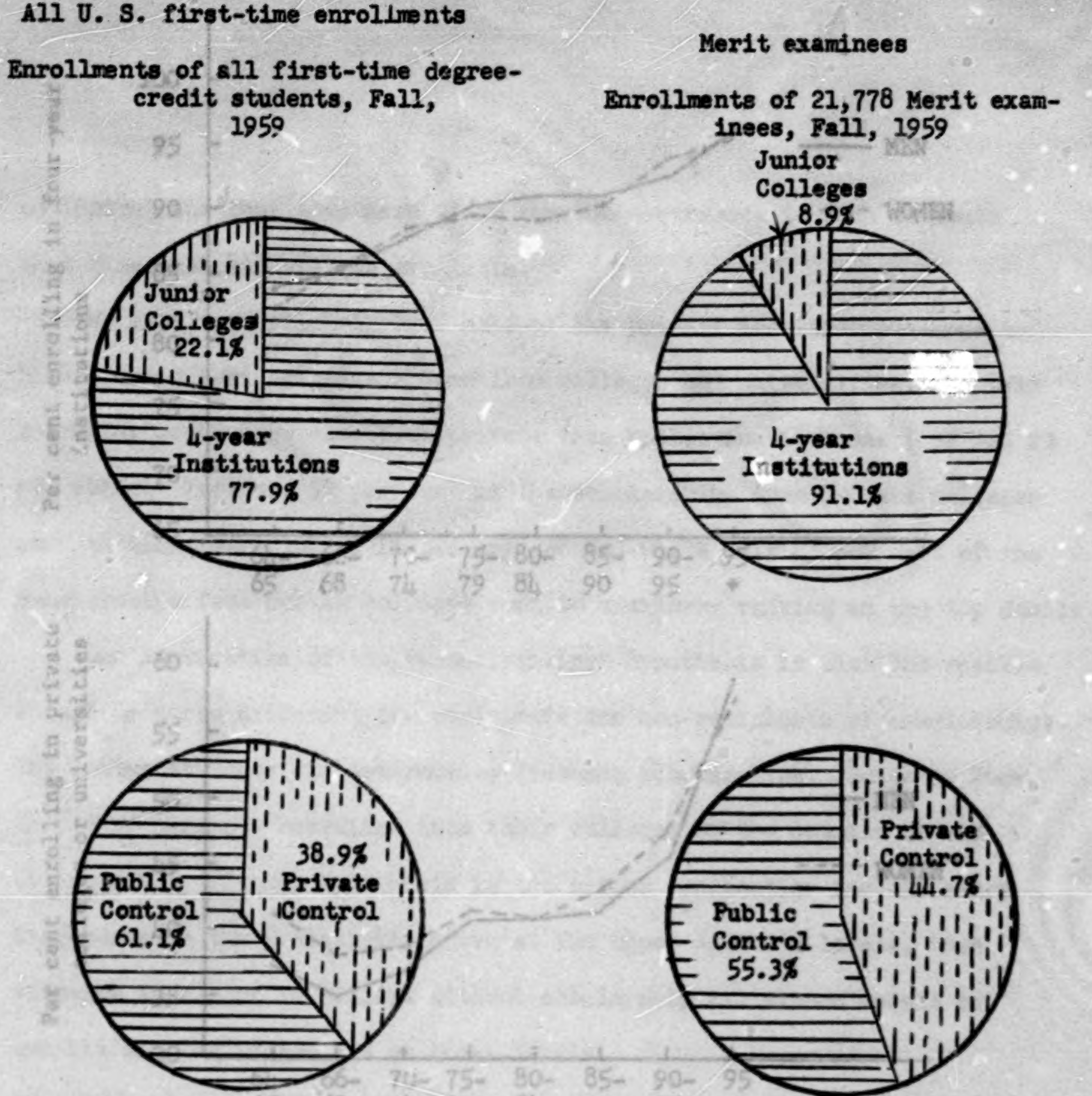

Figure 18 Percentage Analysis of First-Time Degree-Credit Enrollments: Aggregate U. S., Fall 1959 and 21,778 Merit Examinees, Fall, 1959.

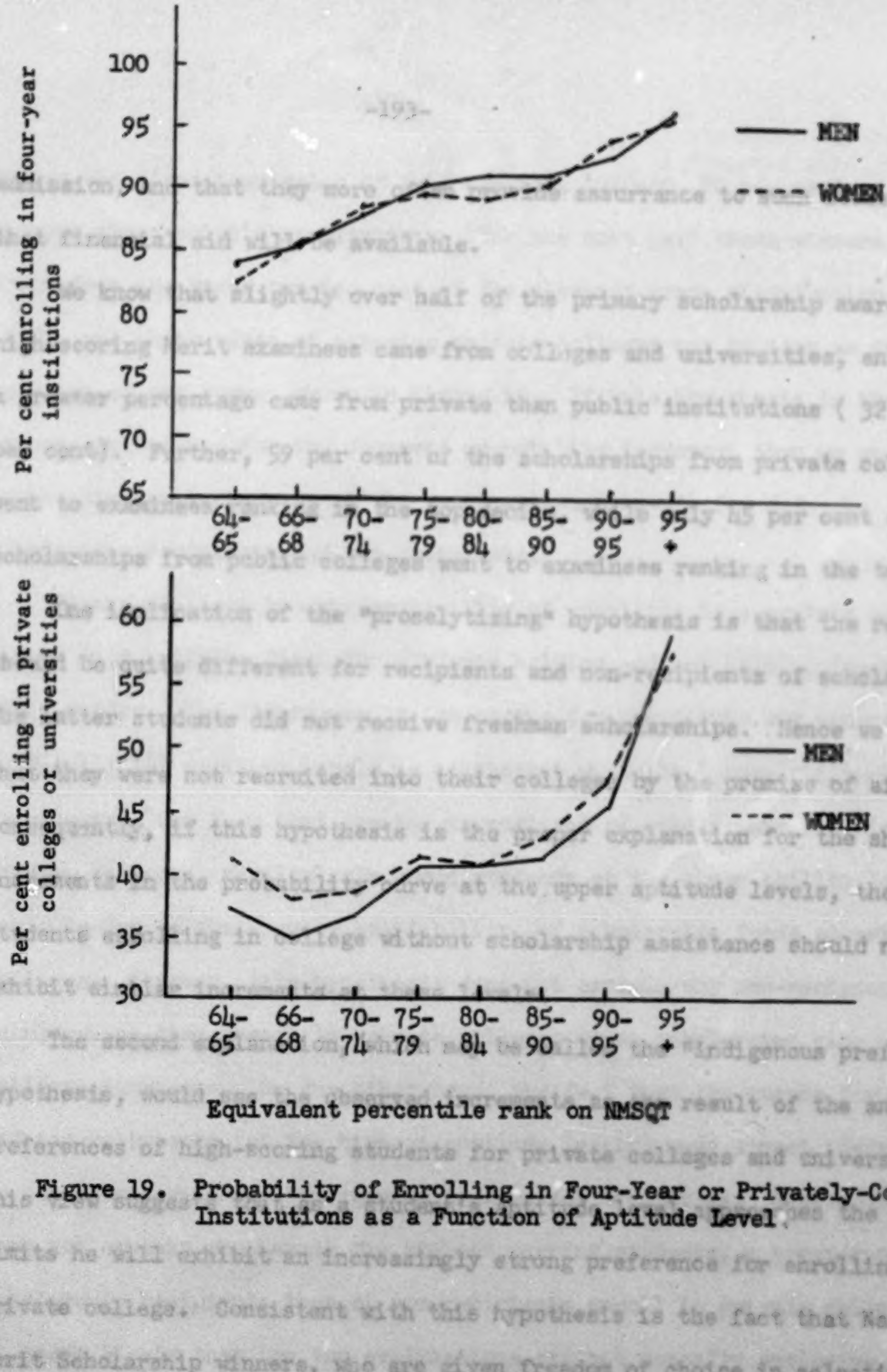

Figure 19. Probability of Enrolling in Four-Year or Privately-Controlled Institutions as a Function of Aptitude Level

admission, and that they more often provide assurance to such students that financial aid will be available.

We know that slightly over half of the primary scholarship awards to high-scoring Merit examinees came from colleges and universities, and that a greater percentage came from private than public institutions (32 vs. 22 per cent). Further, 59 per cent of the scholarships from private colleges went to examinees ranking in the top decile, while only 45 per cent of the scholarships from public colleges went to examinees ranking in the top decile.

One implication of the "proselytizing" hypothesis is that the results should be quite different for recipients and non-recipients of scholarships. The latter students did not receive freshman scholarships. Hence we know that they were not recruited into their colleges by the promise of aid. Consequently, if this hypothesis is the proper explanation for the sharp increments in the probability curve at the upper aptitude levels, then students enrolling in college without scholarship assistance should not exhibit similar increments at these levels.

The second explanation, which may be called the "indigenous preference" hypothesis, would see the observed increments as the result of the antecedent preferences of high-scoring students for private colleges and universities. This view suggests that as a student's aptitude level approaches the upper limits he will exhibit an increasingly strong preference for enrolling in a private college. Consistent with this hypothesis is the fact that National Merit Scholarship winners, who are given freedom of choice in selecting the college they will attend, show a very decided preference for private colleges.

During the first four years of this program, 1956-60, 80 per cent of the winners chose private institutions. For the most part these winners are drawn from the upper two per cent of the eleventh grade distribution on the NMSQT, and their rates of choosing private colleges can be seen as an extrapolation of the curves shown in Figure 19. If this hypothesis is the proper explanation for the observed probability increment then we would expect similar increments at the upper aptitude levels for both scholarship recipients and non-recipients.

Figure 20 shows how the probability of enrolling in a private college varies with aptitude level for students holding and not holding freshman scholarships. The divergence in the curves for recipients and non-recipients at the highest aptitude levels is consistent with the "proselytizing" hypothesis: the fact that greater proportions of scholarship recipients go to private colleges, particularly among students at the upper ability levels, could be due to the greater availability of scholarship funds at private colleges. However, this hypothesis does not explain why non-recipients of scholarships also enroll in private colleges at an accelerated rate as aptitude increases. On the other hand, the fact that the curves for recipients and non-recipients (at the highest aptitude levels) have almost identical slopes is consistent with the "indigenous preference" hypothesis. However, this hypothesis does not explain why, among the highest scoring students, a greater proportion of scholarship recipients than of non-recipients enroll in private colleges. In short, it seems likely that the two explanations are not mutually exclusive. Both may be partially correct explanations for the college choices of high-scoring students.

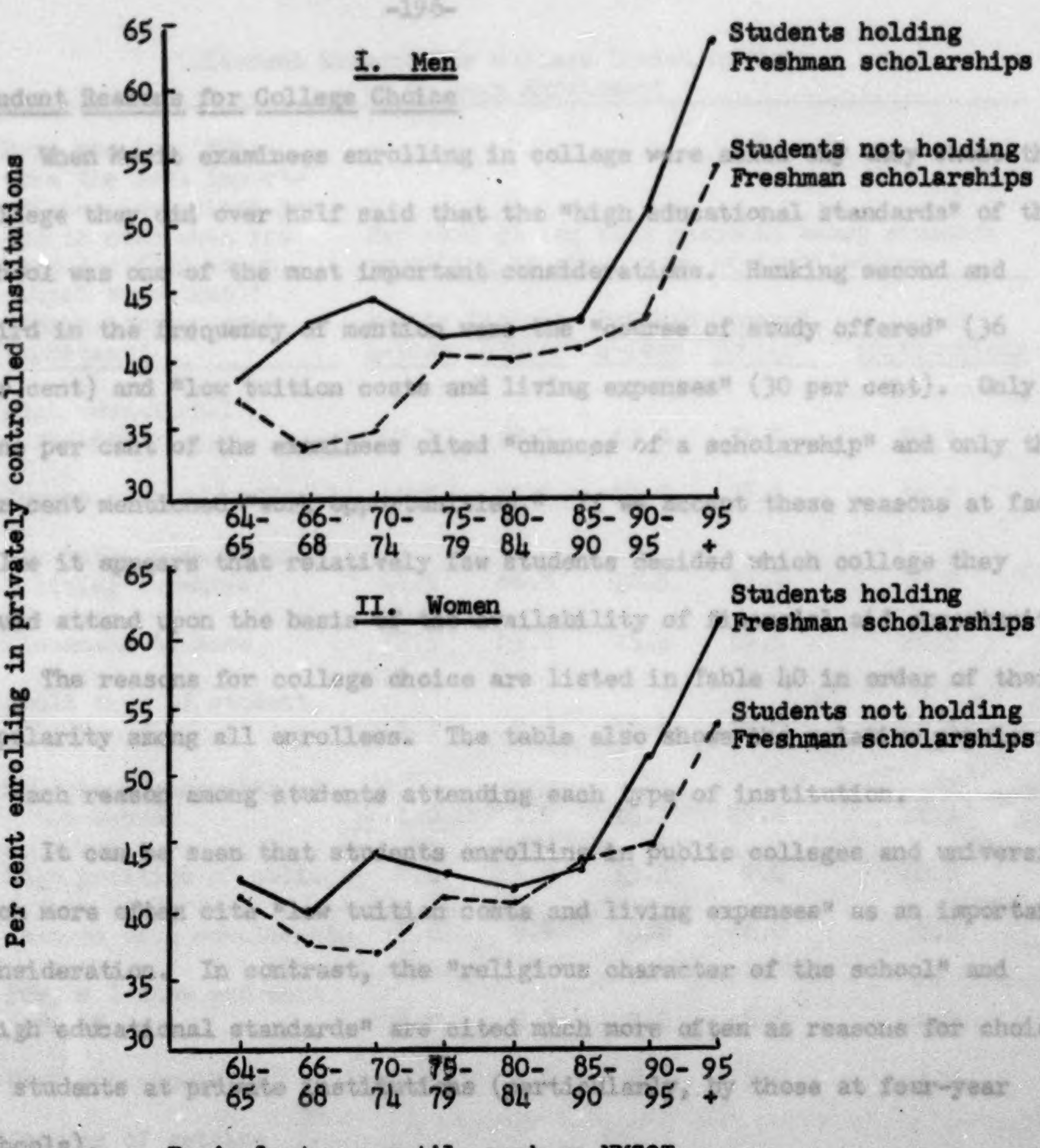

Figure 20 Probability of Enrolling in Privately-Controlled Institutions as a Function of Aptitude Level for Recipients and Non-recipients of Scholarships.

Student Reasons for College Choice

When Merit examinees enrolling in college were asked why they chose the college they did over half said that the "high educational standards" of the school was one of the most important considerations. Ranking second and third in the frequency of mention were the "course of study offered" (36 per cent) and "low tuition costs and living expenses" (30 per cent). Only about nine per cent of the examinees cited "chances of a scholarship" and only three per cent mentioned "work opportunities." If we accept these reasons at face value it appears that relatively few students decided which college they would attend upon the basis of the availability of financial aid opportunities.

The reasons for college choice are listed in Table 40 in order of their popularity among all enrollees. The table also shows the relative popularity of each reason among students attending each type of institution.

It can be seen that students enrolling in public colleges and universities much more often cite "low tuition costs and living expenses" as an important consideration. In contrast, the "religious character of the school" and "high educational standards" are cited much more often as reasons for choice by students at private institutions (particularly, by those at four-year schools).

If we compare the popularities of the reasons for choice among students at four-year schools and at junior colleges the most noticeable differences are these: students going to four-year schools much more often cite "high educational standards," while students going to junior colleges much more often cite "low tuition costs and living expenses" and "closeness to home."

Table 40

Student Reasons for College Choice, by Type of College Enrollment

Response to: "What were the most important considerations you had in mind when you were deciding which school to attend?" (Check the two most important)	Per cent giving each response among students enrolling at given type of institutions				
	Public Control		Private Control		All
	4-year	junior	4-year	junior	institutions
High educational standards	47.3	27.7	62.2	31.7	52.2
Course of study offered	43.5	21.9	29.9	38.1	36.2
Low tuition costs and living expenses	42.5	66.8	10.5	23.3	30.0
Closeness to home	22.5	43.2	14.4	15.4	20.3
Small size of student body	5.1	9.6	19.8	25.0	12.1
Religious character of the school	1.0	1.2	25.1	29.6	11.9
High prestige of college	9.4	1.6	13.9	9.0	10.8
Chances of a scholarship	7.6	5.9	11.0	6.0	8.9
People I know who went to it	5.9	2.3	4.0	5.6	4.9
Work opportunities	2.5	7.6	2.7	3.3	3.0
Chances of getting admitted	2.8	4.1	2.8	4.0	2.9
Other, unclassified responses	4.8	3.8	4.5	6.0	4.6
Number of students	10,612	1,395	9,190	484	21,681*

*Does not include 97 students who did not specify the name of the college attended.

These differences with respect to reasons for college choice between private and public college enrollees and between four-year and junior college enrollees are consistent with response differences on related questions. Thus, in Tables 41 and 42 these groups are compared with respect to nine other student characteristics (the percentages citing "high educational standards" as a reason for college choice are repeated in these tables in order to provide a point of reference). It can be seen in Table 41 that the private college enrollees, who more often say that they chose on the basis of "high educational standards," tend to have higher aptitude scores, more often plan to seek post-graduate training, and more often have parents who attended college. Public college enrollees, who more often say they chose on the basis of "low tuition costs and living expenses," tend to be recruited from less affluent families, more often attend college as commuters, go to college closer to home, and more often report that they have (or planned to get) part-time jobs while in college. Similar congruencies between "reasons" and other attributes are apparent in Table 42, which compares four-year and junior college enrollees.

Intellectual Ability of Students Choosing Different Colleges

How well can we estimate the average aptitude test score of the freshman class at a college from knowledge of the test scores of the Merit examinees it enrolls? Obviously the number of high-scoring examinees enrolling in a given college is a small proportion of the total freshman class at that institution, and the higher the cut-off score used in selecting examinees the smaller will be the proportion of the freshman class represented. It is reasonable to expect therefore that the answer depends upon the cut-off score used in selecting examinees. Thistlethwaite (1959d) reported that for freshman

Table 41

Differences in Student Input Among Publicly and Privately Controlled Colleges and Universities

	Per cent of students exhibiting given characteristic among those enrolling in each type of institution		
Student characteristics	Private Control (9,674 students)	Public Control (12,007 students)	Per cent diff.
Student's family can contribute $800 or more per year to pay college costs.	55.9	39.5	16.4
Student reports "high educational standards" of college the most important consideration in deciding which school to attend.	61.1	45.1	16.0
NMSQT score of 109 or greater.	55.5	44.8	10.7
Student's father completed at least some college.	53.2	43.8	9.4
Going to college more than 50 miles from home.	61.2	52.8	8.4
Student holds freshman scholarship.	36.4	28.6	7.8
Planned at beginning of college to seek post-graduate training.	48.0	40.9	7.1
Student's mother completed at least some college	46.0	39.1	6.9
Attending college as a resident (non-commuter)	71.6	65.2	6.4
Student holds part-time job.	27.0	28.7	-1.7

Table 42

Differences in Student Input Among Four-Year Institutions and Junior Colleges

	Per cent of students exhibiting given characteristic among those enrolling in each type of institution		
Student characteristics	4-year (19,802 students)	Junior college (1,879 students)	Per cent diff.
Attending college as a resident (non-commuter)	71.2	34.2	37.0
Going to college more than 50 miles from home	59.6	24.5	35.1
Student reports "high educational standards" of college the most important considerations in deciding which school to attend	54.4	28.7	25.7
Student holds part-time job in college	26.1	47.3	-21.2
Student's family can contribute $800 or more per year to pay college costs	48.7	27.6	21.1
NMSQT score of 109 or greater	51.0	34.3	16.7
Student's father completed at least some college	49.1	36.3	12.8
Planned at beginning of college to seek post-graduate training	45.1	33.8	11.3
Student holds freshman scholarship	32.9	23.5	9.4
Student's mother completed at least some college	42.7	36.3	6.4

men attending 39 colleges the correlation between mean scores for the entire freshman class on the Scholastic Aptitude Test (SAT) and the percentage of the freshman class who were Merit finalists (C of M winners or Merit Scholars) was .74, while for freshman women attending 43 colleges the correlation between mean freshman SAT scores and this percentage index was .76. Relatively high cut-off scores were involved here, since the bulk of the Merit finalists in any given year have test scores at the 98th percentile or higher. Astin and Holland (1961), who compared average NMSQT scores of examinees in the present sample (where the cut-off score was much lower) with mean SAT scores for the freshman classes at 37 institutions, found a correlation of approximately .90. These data suggest that scores of high-ranking Merit examines enrolling in a given college may give a fairly accurate estimate of the relative aptitude level of the total freshman class at that college.

It should be noted that these correlations tell us nothing about the absolute accuracy with which we can predict the actual magnitude of the average aptitude score at any given college. Average NMSQT scores based on the present sample, which includes only relatively high-scoring students, probably overestimate the average aptitude score of freshmen at most colleges; yet these NMSQT averages may be highly correlated with the average aptitude scores of all freshmen because the relative positions of colleges are not drastically altered by sample biases. These cautions are particularly important in interpreting the data in Figure 21 to be discussed next.

Over 1,400 institutions of higher education were attended by the 21,778 examinees who entered college in Fall, 1959, but only 140 four-year institutions enrolled 35 or more of these examinees. For each of these 140 institutions the median NMSQT score of examinees enrolled was calculated, and the institutions were then ranked on the basis of these average test scores. Limiting the data only to those colleges that enrolled at least 35 Merit examinees, of course, tends to exclude colleges with relatively small enrollments. For example, the California Institute of Technology and Reed College were both excluded by this criterion. Nonetheless, those colleges ranking highest are presumably among the most selective with respect to the aptitude scores of students they enroll, and those ranking lowest are presumably among the least selective with respect to the aptitude scores of students they enroll.

Figure 21 summarizes information about selected precentile equivalents for the distributions of test scores of examinees enrolling at the ten highest-ranking and at the ten lowest-ranking institutions, both among the 57 private and the 83 public institutions meeting the criterion. Thus the bar in the first row in Figure 21 shows the 25th, 50th, and 75th NMSQT percentile equivalents relative to all examinees enrolling in private, four-year colleges (these equivalents are 100.4, 111.6, and 124.7, respectively). The bar in the second row indicates that the median NMSQT score of examinees enrolling in one of the ten highest-ranking private colleges was 132.6, and that only about two and a half per cent of all eleventh-grade students in the nation would be expected to have a score this high or higher. From the third bar, the median NMSQT score for examinees enrolling in one of the ten lowest-ranking private colleges can be read as 105.8; approximately 17 per cent of all eleventh-grade students would be expected to have a score this high or higher.

Clearly there is greater diversity among private colleges than among public colleges with respect to the average aptitude scores of entering classes. This is indicated in Figure 21 by the wider separation between the medians for examinees going to high-ranking and low-ranking private colleges, then between the medians for examinees going to high-ranking and low-ranking public colleges.

These results make it quite evident that proper counseling of a student with respect to his ability to compete with other students at a college must take into account the aptitude selectivity of students at the particular college. For example, a student with an NMSQT score of 110, which is equivalent to a percentile rank of 87 relative to all eleventh graders, might well expect to survive in the lower-ranking private and public colleges in our sample, but his chances of admission are not even good at the highest-ranking private colleges.

Parents, teachers, and high-school counselors often face the problem of trying to estimate how a student with a given college aptitude test score is likely to compare with other students enrolling at a given college. Yet relatively few colleges publish information about the aptitude scores of their freshman classes, and counselors often must rely upon hearsay and college imagery of unknown validity.[2] From the point of view of reducing

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[2] Riesman and Jencks (1962) have pointed to some of the factors presumably underlying the reluctance of colleges to provide their publics with more "consumer-research" data. They write, "If the median Scholastic Aptitude Test score is high, the college fears this may scare away students with low scores but special aptitudes whom the college wants. If the median scores are low, the college fears freezing its mediocre image and thus obstructing its hope of getting better students. Indeed, most colleges resist consumer research not so much because they don't want people to know what they are now like as because they fear that their shortcomings, if generally recognized, will become fixed in the public mind, and hence be irremediable."

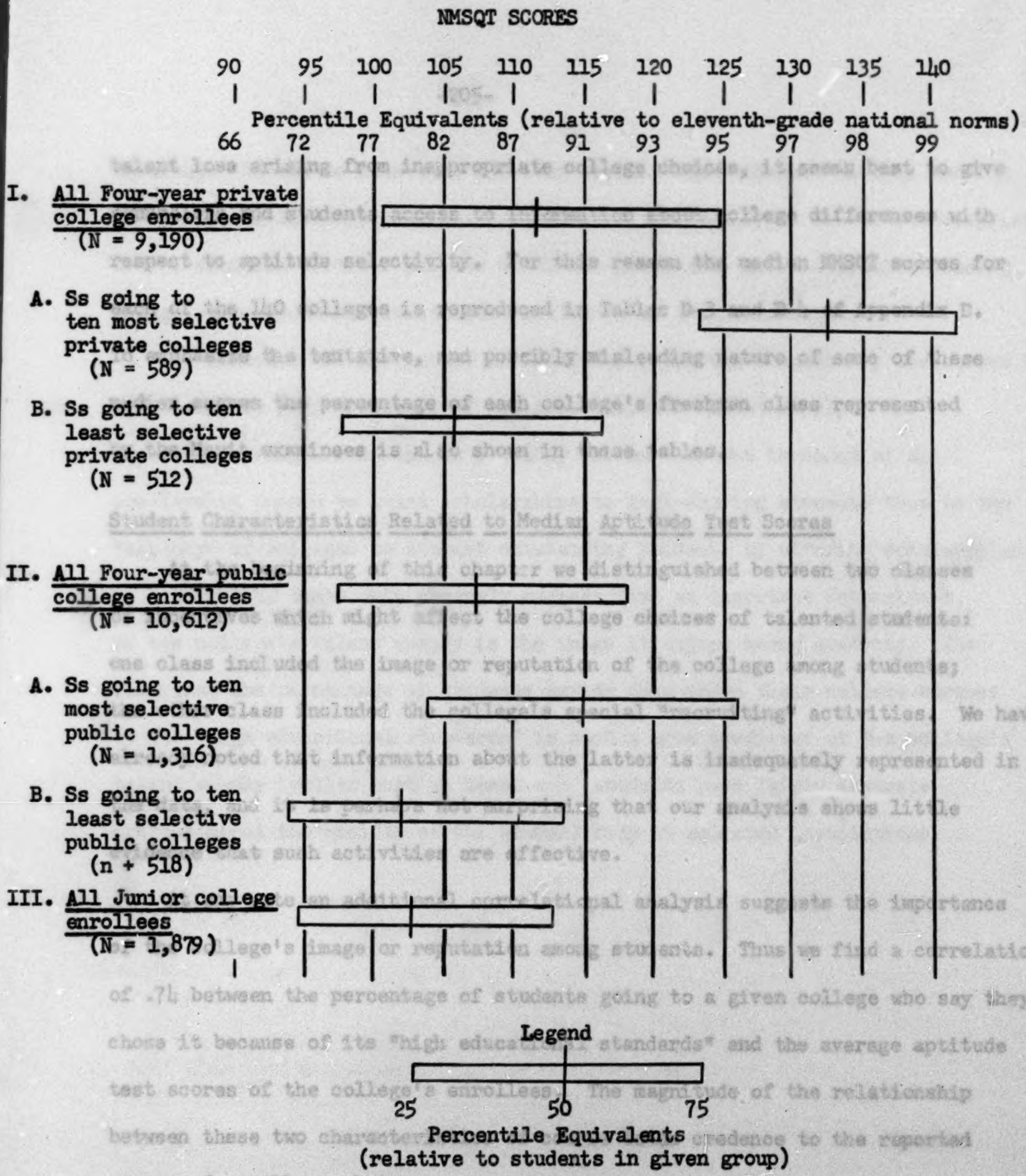

Figure 21. Aptitude Test Score Distributions of High-Ability Merit Examinees by College of Initial Registration

talent loss arising from inappropriate college choices, it seems best to give counselors and students access to information about college differences with respect to aptitude selectivity. For this reason the median NMSQT scores for each of the 140 colleges is reproduced in Tables D-3 and D-4 of Appendix D. To emphasize the tentative, and possibly misleading nature of some of these median scores the percentage of each college's freshman class represented by the Merit examinees is also shown in these tables.

Student Characteristics Related to Median Aptitude Test Scores

At the beginning of this chapter we distinguished between two classes of incentives which might affect the college choices of talented students: one class included the image or reputation of the college among students; the other class included the college's special "recruiting" activities. We have already noted that information about the latter is inadequately represented in the data, and it is perhaps not surprising that our analysis shows little evidence that such activities are effective.

At any rate an additional correlational analysis suggests the importance of the college's image or reputation among students. Thus we find a correlation of .74 between the percentage of students going to a given college who say they chose it because of its "high educational standards" and the average aptitude test scores of the college's enrollees. The magnitude of the relationship between these two characteristics of course lends credence to the reported reasons for college choice.

Additional correlates of the college's talent supply are shown in

Table 43. It can be seen that the four student input characteristics showing the highest relationship to the college's talent supply are either characteristics of the students or their parents which are presumably associated with placing a high value upon the educational excellence of the institution.

In contrast the percentage of examinees receiving scholarship assistance is a relatively poor predictor of the institution's talent supply. The observed correlation of .41 is probably due more to the tendency of all scholarship donors to award scholarships to high-scoring students than to the "ability" of colleges to attract outstanding students by offering scholarships.

In short, these data strongly suggest that an important determinant of the college's talent supply is the image it enjoys among students. The fact that the percentage of students saying they chose their college because of its "high educational standards" is such a good predictor of the college's talent supply implies that at least some students have fairly accurate notions about the quality of the student body at selected institutions.

Table 43

College Input Characteristics Related to the Average Aptitude Test Score of Examinees Enrolled at 140 Colleges and Universities

Student input characteristic	Correlation between Median NMSQT Score and input characteristics
Per cent saying they chose college because of its "high educational standards".	.74
Per cent planning to seek post-graduate training in Fall.	.60
Per cent whose fathers had at least some college.	.56
Per cent whose mothers had at least some college.	.53
Per cent whose families can contribute $800 or more per year for college costs.	.51
Per cent holding freshman scholarships.	.41
Per cent going to college more than 50 miles from home.	.26
Per cent attending college as residents.	.23
Per cent expecting to hold part-time jobs in college.	-.11

Chapter 11

SCALES FOR ASSESSING COLLEGE CHARACTERISTICS

In the remaining chapters of this report we shall consider how the student's college experiences are related to his persistence in college and to changes in his motivation to seek advanced graduate professional degrees. The present chapter describes the methods developed for documenting and describing relevant differences in college environments, while later chapters present tests of hypotheses concerning the role of faculty and student cultures in mediating some of the observed changes in student plans and aspirations.

Related Research on College Press Scales

Stern (1958) and Pace and Stern (1958) constructed the first version of an inventory, called the College Characteristics Index (CCI), designed to measure faculty and student "press" at different colleges. The meaning of the CCI press scales is best understood by considering Henry Murray's (1939) need classification. According to Murray's taxonomy the personality of an individual can be described by measuring the strength of his needs for abasement, achievement, affiliation, etc. In writing items for the CCI, Pace and Stern asked the question, "What is there in a college environment which might be satisfying to, or which would tend to reinforce or reward, an individual who has a high need for abasement, achievement, affiliation, etc.?" Stated differently, what are the characteristics of an environment which exerts a pressure toward or a demand for abasement, achievement, etc.? Thus it was expected that a student with a strong need for order might find especially satisfying or rewarding a college environment described by the following statements (all of which are taken from the "Order" scale of the CCI):

> In many classes students have an assigned seat.
>
> Faculty members and administrators have definite and clearly posted office hours.
>
> Professors usually take attendance in class.
>
> Classes meet only at their regularly scheduled time and place.

In completing the CCI the respondent judges whether each of 300 statements is probably true or probably false about his college. Given a representative sample of students at any college the inventory permits one to describe the college environment's demands, or "press," along some 30 dimensions conceived as counterparts to Murray's hypothesized needs.

College press and student aspirations. Using the 300-item CCI, Thistlethwaite (1959d, 1959e) showed that student perceptions of their college environments were related to the institution's output of graduates who later earned the Ph.D. In this study the college productivity measures employed were conceptually similar to those of Knapp and Goodrich (1952), who calculated the rate at which the college's baccalaureates were later listed in American Men of Science, and of Knapp and Greenbaum (1953) who calculated the rate at which the college's baccalaureates later won graduate fellowships or Ph.D.'s. Several investigators(Stuit, Helmstadtler, & Fredericksen, 1956; Holland, 1957) have pointed out that some institutions get a higher proportion of talented students than others and so should be expected to have a higher proportion of their graduates attain Ph.D.'s.

Consequently, adjustments were made in this initial study to control college differences in the quality of the incoming freshman class. Another refinement was that separate "productivity" indices were calculated for the output of alumni who later earned Ph.D.'s in the natural sciences, and for alumni later earning Ph.D.'s in the arts, humanities, and social sciences. National Merit finalists attending each of 36 colleges, for which these productivity indices were available, were asked to complete the CCI, and median scores were computed for each college on each of the 30 press scales. When these medians were then correlated with each of the productivity indices, 12 of the 30 scales yielded a correlation significant at the .01 level or higher. Productivity in the natural sciences was positively related to press for scientism, aggression, and impulsion, and negatively related to press for order, deference and sentience. Productivity in the humanities was positively related to press for humanism, reflectiveness, sentience, harm-avoidance, and understanding, and negatively related to press for pragmatism, deference, and abasement.

Although these findings suggest that faculty and student cultures have an impact upon the achievement motivation of undergraduate students, the implications were ambiguous because most of the CCI scales were composites of items descriptive of students and faculty. For example, the Humanism scale in the Pace and Stern inventory contained five items describing students and five items describing the faculty or administration of the college. Therefore another analysis was made in this initial study based upon revised scales containing more homogeneous items. A set of student press scales was devised so that each scale included only those items descriptive of student values, interests, or behaviors. Similarly, a group of faculty press scales was constructed which included only those items descriptive of the college faculty or administration. Items which seemed to describe the same trait and which exhibited the same pattern of correlations with the two productivity measures were grouped together, and only those items which discriminated between "high-producing" and "low-producing" colleges were retained. Using the revised scales, it was found that productivity in the humanities was positively related to student press for humanism, breadth of interests, and reflectiveness while productivity in the natural sciences was positively related to student press for scientism and aggression. Considering the revised faculty press scales, colleges with high outputs in the humanistic fields tended to be characterized by excellent social science faculties and resources, a flexible, or somewhat unstructured, curriculum, energy and controversiality of instruction, and informality and warmth of student-faculty contracts. Productivity in the natural sciences were also related to informality and warmth of student-faculty contracts, and in addition to a lack of close faculty supervision and to relatively non-directive or non-predictable teaching methods.

Two additional studies were subsequently carried out to test the postdictive validities of the faculty and student press scales which had been suggested by the analysis of the discriminatory powers of each of the CCI items. In the first of these (Thistlethwaite, 1960), a relatively crude criterion of change in motivation for advanced training was devised by asking 1,500 National Merit finalists, who had completed the junior year of college, to indicate whether the level of training they hoped to achieve had changed since they had entered college. Comparisons were then made between the reported college press of students who said their aspirations had increased and of those who said their aspirations had not changed during the first three years of college. Most of the predicted differences with respect to the faculty press scales were confirmed, but none of the differences with respect to the student press scales were statistically significant. Thus increases in motivation for advanced degrees in the humanities were positively associated with faculty press for achievement, affiliation, enthusiasm, humanism, and independence. Increases in aspirations in the natural sciences were positively related to enthusiasm, but negatively related to press for compliance.

In a second study (Thistlethwaite, 1962) a more refined measure of change in degree aspirations was obtained by asking another sample of 1,072 Merit finalists to indicate the highest level of education (LOA) they planned to complete--both as they recalled their plans when they first entered college and as they were at the end of the sophomore year in college. The average terminal level of aspiration(LOA) of students reporting strong press of a given kind (e.g., strong faculty press for independence) was then compared with the average LOA for students reporting weak press. By means of covariance analysis it was possible to partial out group differences with respect to average initial LOA. Among men increases in LOA were found to be associated with faculty press for independence, supportiveness, and affiliation, and with the absence of faculty press for vocationalism. In addition, participation in college Honors programs and exposure to peer groups characterized by openness to faculty influence were related to increases in aspirations. On the other hand, the 10 faculty press scales and the 10 student press scales were virtually unrelated to changes in the aspirations of the female finalists.

Limitations of previous studies. Although the foregoing studies show fairly good agreement and suggest that student degree aspirations are at least partly shaped by institutional impact, there are in each case rival hypotheses which might be advanced to account for the results. In the first study, college outputs of potential Ph.D.'s were adjusted for differences in aptitudes of incoming freshmen classes, but sex, aspirational, and other personality characteristics of the institution's entering classes were not controlled. In the second study (Thistlethwaite, 1960) the analysis compared the reported press of students saying they had increased their aspirations with those saying they had not changed their aspirations. The subgroup reporting positive changes (those increasing their LOA) is likely to have had a greater proportion of subjects who initially aspired only to the Bachelor's degree, while the subgroup reporting no change in aspirations is likely to have had a greater proportion who initially aspired to a higher level degree. However, subjects with low initial LOA's should regress upward on any retest, while those with high initial LOA's should regress downward. Thus differential regression effects may have been confounded with the "effects" of college press in this analysis. The covariance method used in the third study (Thistlethwaite, 1962) ruled out such differential regression effects, but it was still necessary in that study to rely upon retrospective recall of initial LOA. Though it is difficult to imagine how inaccurate recall could have produced spurious results in this study, it is worth asking whether the apparent effects of different learning environments would disappear if potential errors of recall were ruled out. Since students in the present sample were asked their LOA shortly after they entered college in Fall, 1959, and again after they had completed 2 years of college in June, 1961, it was possible to rule out this source of ambigiuty. Chapter 13 describes results which indicate that the observed differences were not due merely to inaccuracies in the recall of degree aspirations.

Item Analysis for Constructing Revised College Press Scales

In preparing revised press scales for use in the present study additional analyses were made of the responses to college press items of the 1,072 Merit finalists described by Thistlethwaite (1962). Items were selected both with respect to their ability to discriminate between criterion groups and with respect to their internal consistency with other items belonging to the same scale.

Selection of items to increase validity. Merit finalists were first classified by sex and by forr initial levels of aspiration. Two of the eight groups thus segregated were discarded because the number of subjects was too small to provide a reliable basis for item selection. The six groups remaining included 143 men and 262 women who planned to complete only "some college" or only a Bachelor's degree, 112 men and 126 women who planned to obtain a Master's degree or its equivalent, 129 men who planned to obtain an M.D., D.D.S., or similar professional degree, and 226 men who planned to obtain the Ph.D. or its equivalent. For each of the four groups starting college with the "Bachelor" or "Master" LOA, subjects were segregated with respect to changes in LOA during the first two years of college: subgroup A consisted of "positive changers" (those increasing their aspirations) and subgroup B consisted of "nonchangers" (those not changing or decreasing their aspirations). Similarly, for the male groups at the two highest initial aspiration levels subjects were segregated with respect to changes in LOA: subgroup A consisted of "nonchangers" (those not changing to a lower level) and subgroup B consisted of "negative changers" (those changing to a lower level). It will be noted that the "A" subgroup at each initial LOA showed greater terminal aspirations than the "B" subgroup. In this way six A-B pairs of criterion groups were designated. The subsequent item analysis examined the extent to which the "A" members of each pair of groups had perceived a different college press than the "B" members of each pair. Only those items were retained for which a greater proportion of the "A" subjects than of the "B" subjects answered the item in the keyed direction for at least four of the six pairs of criterion groups. Thirty-one of the 100 faculty items and 48 of the 100 student items were rejected on the basis of this validity rule.

Selection of items to increase the internal consistency of scales. A second basis of item selection was the followint rule: for each scale in which no more than three items had been rejected by the preceding procedures, items had to have an item-test correlation of at least .50 to be retained in their original scales. For scales in which more than three items had been rejected on the basis of the validity rule, item homogeneity indices were ignored, since the indices had less relevance in these cases. Items rejected solely on the basis of internal consistency considerations were assigned to a pool of items from which one new scale cluster was formed (student press for intellectualism).

Revised college press scales. Any scale in which five or more items had been rejected by these two item selection procedures was eliminated. On this basis, one of the 10 faculty press scales (scientism) and six of the 10 student press scales (achievement, aggression, breadth of interests, participation, scientism, and openness to faculty influence) were eliminated. The remaining press scales were then augmented by new items similar in content to the surviving items so that each revised scale contained 10 items. These scales, together with the new scale, made up the revised Inventory of College Characteristics sent to examinees in June, 1961. Table E-1 in Appendix E shows the 10 items belonging to each of the 14 revised press scales, while Appendix G shows a copy of the Inventory in the form in which it was presented to examinees.

Method of Sampling College Environments

The student sample asked to complete the Inventory of College Characteristics in June, 1961 contained only examinees enrolled at one of the 140 colleges listed in Appendix D (Tables D-3 and D-4). At each institution enrolling more than 60 examinees a random sample of 60 students was designated, and at all institutions enrolling 35-60 all enrollees were designated, to receive the mail survey containing the Inventory. Thus the designated sample included 7,464 examinees. Useable returns were received from 4,330 students, or 58 per cent, of the designated sample.[1]

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[1] Two per cent of the non-respondents represent students who were untraceable or who were deceased, and three per cent represent students who actually returned the Inventory but completed it describing a college into which they had transferred.

Table 44 shows how the response rate varied by sex and aptitude level. Women responded more frequently than men (63 vs. 55 per cent) and students with high aptitude test scores responded more frequently than those with low test scores. Response rates also varied considerably by college. Thus 85 per cent of the examinees at Smith College returned useable inventories, while at the other extreme only 36 per cent of the examinees at Tufts University responded. Among the 140 colleges the median percentage returning useable inventories was 58.3. One fourth of the college samples had response rates greater than 66 per cent, while three-fourths of the college samples had response rates greater than 52 per cent. One consequence of the variation in response from college to college is that the mean press scores calculated for colleges was less reliable for some colleges than for others.

There was no appreciable difference in the response rates of examinees enrolled at private colleges (60 per cent) and those enrolled at public colleges (58 per cent).

Statistical Properties of College Press Scales

Reliabilities of scales. Estimates of scale reliabilities (Kuder-Richardson Formula 20 estimates) were obtained from the responses of a 20 per cent random sample of respondents. The results indicate that each scale has sufficient internal consistency to be considered a measure of a single attribute of college environments. Seven of the scales had reliability coefficients of .75 or greater, while the four scales with the lowest indices of internal consistency had coefficients of approximately .60. Table E-1 in Appendix E summarizes these coefficients, and shows the correlation between each item and total scale scores.

Table 44

Response Rate to Inventory of College Characteristics Sent in June, 1961 to 7,464 Examinees

NMSQT score interval	Equivalent percentile rank relative to national norms	Number of examinees in designated sample	Number of examinees returning useable inventories	Per cent responding
I. Women				
88 - 102	64 - 79	982	557	56.7
103 - 107	80 - 84	373	231	61.9
108 - 113	85 - 89	408	266	65.2
114 - 124	90 - 94	643	434	67.5
125 and over	95+	569	394	69.2
Total		2,975	1,882	63.3
II. Men				
88 - 102	64 - 79	1,356	643	47.4
103 - 107	80 - 84	501	248	49.5
108 - 113	85 - 89	617	328	53.2
114 - 124	90 - 94	872	474	54.4
125+	95+	1,143	755	66.1
Total		4,489	2,448	54.5
III. Men and Women				
88 - 102	64 - 79	2,338	1,200	51.3
103 - 107	80 - 84	874	479	54.8
108 - 113	85 - 89	1,025	594	58.0
114 - 124	90 - 94	1,515	908	59.9
125+	95+	1,712	1,149	67.1
Total		7,464	4,330	58.0

The latter correlations are useful in identifying the items "most characteristic" of each cluster, and provide a check upon the extent to which the scale names are descriptive of the clusters. An examination of these correlations suggests that most of the scale names are appropriate. However two of the scale names, Student Press for Social Conformity and Student Press for Intellectualism may be misleading. The most characteristic response indicating a Social Conformity press is a "False" response to "Ignorance of social customs is no handicap to the student here." Perhaps a better name for this cluster would be "Student Press for Social Sophistication." The most characteristic responses indicating a press for Intellectualism were a "False" response to "Students here rarely get excited about a campus speaker," and "True" responses to "Most of my associates admire their teachers" and "Students spend a lot of time planning their intellectual careers." Clearly this latter cluster does not refer an intellectual press which demands that students become "book grinds" or "ivory tower specialists." Possibly a better name for this cluster would be "Student Press for Intellectual Mastery."

Discriminatory powers of scales. To study the power of each cluster of items to reveal differences among college environments an analysis of variance was made for the scores on each scale. Table 45 summarizes for each scale the F-ratio and (in the last column) an index of discriminatory power. Although each of the 14 press scales revealed significant differences between colleges at the .01 level, some scales had much greater discriminatory power than others. For example, classification by college accounted for more than 30 per cent of the total variance of scores on the Vocationalism scale,

Table 45

Differences in Characteristics of College Press at 140 Colleges and Universities

llege press scale	Average press score at institution with			F-ratio (for significance of differences between mean press scores)‡	Proportion of variance associated with college classification*
	Highest mean score	Lowest mean score	mean diff.		
culty Vocationalism	8.68	1.92	6.76	14.2	.304
udent Social Conformity	8.86	2.55	6.31	11.6	.252
culty Humanism	9.12	2.88	6.24	11.1	.250
udent Estheticism	9.08	1.64	7.44	10.7	.243
aculty Compliance	9.29	2.75	6.54	10.1	.232
aculty Achievement	8.62	3.53	5.09	7.7	.180
tudent Competition	9.44	4.24	5.20	7.6	.179
tudent Reflectiveness	9.12	3.42	5.70	8.4	.162
aculty Independence	8.21	4.02	4.19	5.4	.129
aculty Affiliation	8.88	2.77	6.11	5.3	.121
aculty Enthusiasm	8.95	3.43	5.52	4.8	.108
tudent Intellectualism	8.50	4.40	4.10	4.6	.102
aculty Directiveness	8.44	4.65	3.79	2.8	.054
aculty Supportiveness	8.10	3.65	4.45	1.8	.027

‡All F-ratios were statistically significant at the .01 level.

*This index was derived by dividing th error variance (within school variance) y the total variance and subtracting this ratio from one. The tabled value is equivalent o epsilon squared (Nunnally, 1960; Peters & Van Voorhis, 1940).

while it accounted for less than three per cent of the variance of scores on the Supportiveness scale. Clearly this sample of 140 colleges differed markedly with respect to the relative stress of the faculty upon preparing students for particular vocations but they differed only slightly with respect to faculty press for Directiveness.

Some of these differences in the discriminatory powers of scales undoubtedly reflect a specialization of function in American colleges. This can be seen more clearly in Figure 22, which shows the non-overlapping distributions of scale scores for Wellesley College and for the Drexel Institute of Technology on the Vocationalism scale. A technological institute which does not produce a strong image of vocationalism might conclude that its curriculum is in need of revision, while a small, women's liberal arts college might consider such an image to be incompatible with its objectives. It is not surprising that on the Humanism scale, also shown in Figure 22, Wellesley students report the highest press for Humanism while students at the Georgia Institute of Technology report the weakest press for Humanism.

Other differences between colleges are not so readily attributable to institutional objectives. For example, 18 per cent of the total variance of scores on the scale, Faculty press for Achievement, is associated with the classification by college. College faculties also appear to differ markedly with respect to press for Compliance. These and other differences in the student cultures at various colleges hardly appear to be the consequence of deliberate administrative policy.

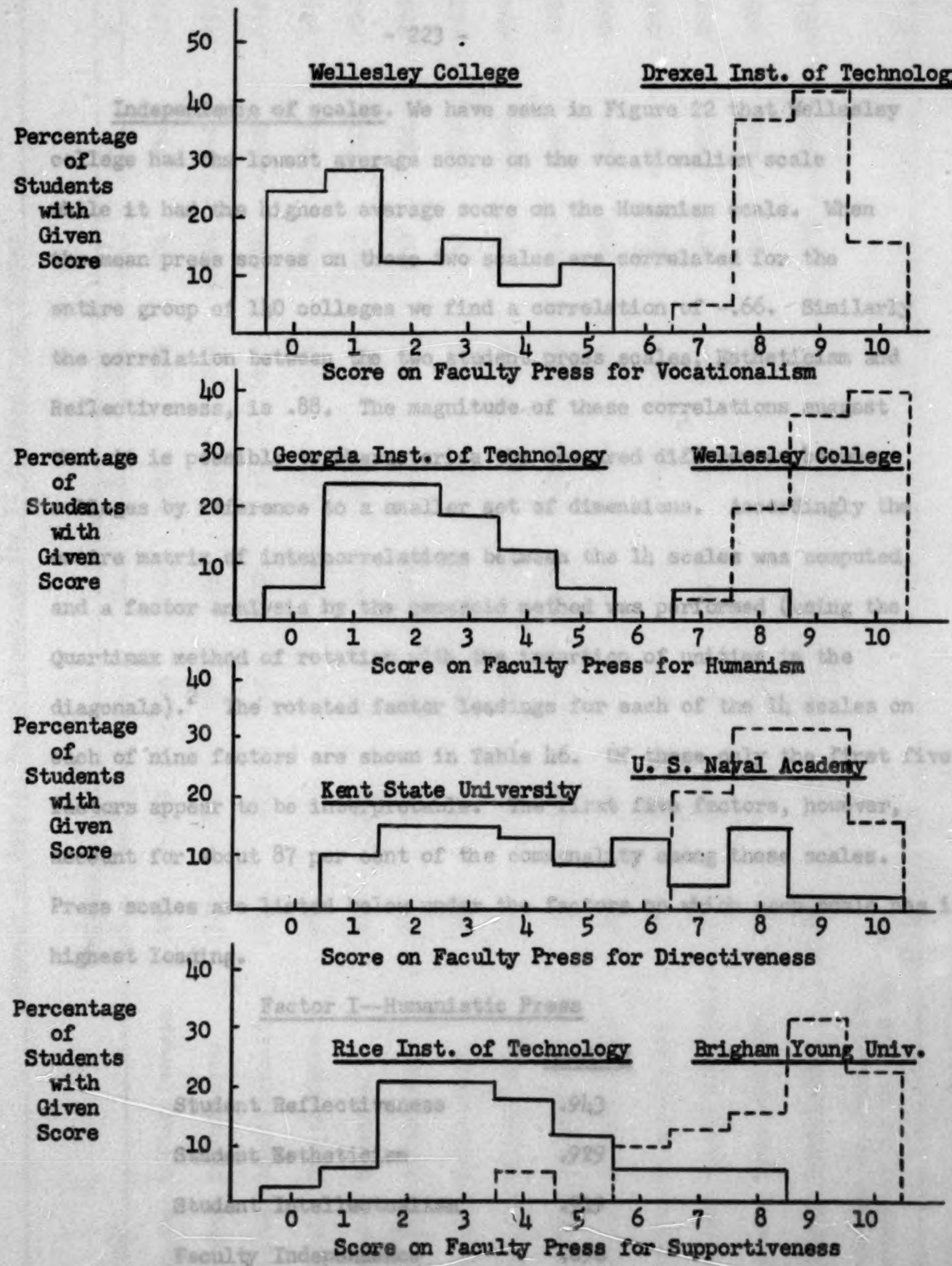

Figure 22. Distributions for Colleges with Lowest and Highest Average Scores on Scales for Assessing Faculty Press for Vocationalism, Humanism, Directiveness, and Supportiveness.

Independence of scales. We have seen in Figure 22 that Wellesley college had the lowest average score on the vocationalism scale while it had the highest average score on the Humanism scale. When the mean press scores on these two scales are correlated for the entire group of 140 colleges we find a correlation of -.66. Similarly the correlation between the two student press scales, Estheticism and Reflectiveness, is .88. The magnitude of these correlations suggest that it is possible to characterize the measured differences between colleges by reference to a smaller set of dimensions. Accordingly the entire matrix of intercorrelations between the 14 scales was computed, and a factor analysis by the centroid method was performed (using the Quartimax method of rotation with the insertion of unities in the diagonals).[2] The rotated factor loadings for each of the 14 scales on each of nine factors are shown in Table 46. Of these only the first five factors appear to be interpretable. The first five factors, however, account for about 87 per cent of the communality among these scales. Press scales are listed below under the factors on which each scale has its highest loading.

Factor I--Humanistic Press

	Loading
Student Reflectiveness	.943
Student Estheticism	.929
Student Intellectualism	.919
Faculty Independence	.898

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[2] Table E-2 in Appendix E shows the correlation matrix.

Table 46

Summary of Rotated Factor Loadings for 14 College Press Scales

Scale	Factors 1	2	3	4	5	6	7	8	9
Student Reflectiveness	.943	-.041	-.036	-.074	-.020	.048	.104	-.091	.179
Student Estheticism	.929	-.080	.015	.056	.025	.038	-.040	.162	.229
Student Intellectualism	.919	.062	.152	-.051	.144	.095	.026	-.208	.042
Faculty Independence	.898	.255	-.045	-.004	-.012	.024	-.086	-.011	-.231
Faculty Humanism	.845	.116	.239	.191	.031	-.131	.092	.362	.025
Faculty Enthusiasm	.831	.269	-.008	-.147	.180	.161	.033	.002	-.295
Faculty Achievement	.761	.076	-.259	-.494	.046	-.063	.152	-.078	-.145
Faculty Affiliation	.616	.709	.077	.088	-.012	-.121	.080	-.150	-.010
Student Competition	.521	-.027	-.087	-.797	.163	.022	-.037	.006	.025
Faculty Supportiveness	.390	.857	.019	-.039	.209	.103	-.020	.089	.003
Faculty Directiveness	.307	.166	.083	-.110	.912	.019	.012	-.002	-.005
Student Social Conformity	-.056	.037	.980	.067	.063	.017	.020	.005	-.002
Faculty Vocationalism	-.745	.115	.088	-.015	.072	.603	.041	-.025	-.009
Faculty Compliance	-.784	.150	.271	.020	.079	.087	.478	.034	.001
Per cent of communality: accounted for by each factor:	55.7	11.9	9.1	6.3	3.8	2.8	2.2	1.7	1.8
Cummulative per cent of communality accounted for by first n factors:	55.7	67.6	76.7	83.0	86.8	89.6	91.8	93.5	95.3

Factor I--Humanistic Press (Continued)

	Loading
Faculty Humanism	.845
Faculty Enthusiasm	.831
Faculty Achievement	.761
Faculty Vocationalism	-.745
Faculty Compliance	-.784

This bi-polar factor, which accounts for 56 per cent of the communality, represents a dimension of college press which may be called "Humanistic Press." The first seven press scales with high positive loadings on this factor clearly measure attributes of the college which are highly intercorrelated. Unfortunately the amount of redundancy in these scales was not foreseen. One implication of this redundancy, of course, is that the "battery" of press scales had considerably less coverage than was supposed. The negative loadings for Vocationalism and Compliance indicate that colleges ranking high on this dimension tend to have faculties which place relatively little emphasis upon vocational training and which do not exercise strong demands for student compliance to course and curriculum requirements.

Factor II--Warmth of Human Relations

	Loading
Faculty Supportiveness	.857
Faculty Affiliation	.709

This factor, which accounts for 12 per cent of the reliable variance in the college press scores, clearly refers to a dimension of warmth or friendliness in the faculty's interactions with students.

The remaining three factors which are interpretable are each represented by only one scale, indicating that each of these scales is relatively unique in terms of its contribution to the battery. Thus, student press for Social Conformity had a loading of .980 on Factor III; student press for Competition has a loading of -.797 on Factor IV; and faculty Directiveness had a loading of .912 on Factor V. There is, of course, little basis for naming these factors differently than the associated press scale, except to note that Factor IV refers to an absence of student competition.

This analysis indicates that the 14 press scales might be replaced with little loss by scores on each of the five factors. This smaller set of dimensions was not in fact adopted in subsequent analysis, since it seemed likely that any implications for teachers and administrators suggested would be more understandable if the college's press was described by measures referring specifically to students or to faculty rather than to composite descriptions of both.

In summary, a set of 14 college press scales were developed by identifying those characteristics of faculty and student cultures which discriminate between groups of students reporting different kinds of changes in degree aspirations during the undergraduate years. Information has been presented indicating that each of the scales has adequate internal consistency, and is useful in discriminating between colleges. Although some of the scales show considerable overlap, as indicated by the intercorrelations among average press scores of students attending 140 colleges, at least five relatively independent dimensions are represented. The method of scale construction suggests that the press scales will be useful in identifying features of the college environment which motivate students for advanced training. In Chapters 12 and 13 we shall consider the findings concerning the validities of the scales in predicting changes in student plans and aspirations.

Chapter 12

ATTRITION AMONG HIGH-ABILITY COLLEGE STUDENTS

What changes might be made in America's colleges and universities to "salvage" more potentially talented students for careers requiring highly developed abilities and skills? One way of obtaining information which may be useful in answering this question is to compare student subgroups and colleges differing in withdrawal or retention rates. This chapter describes such comparisons and discusses their implications.

Knoell (1960) and Summerskill (1962), who have published recent reviews of the literature on college attrition, both point to the great variability in attrition rates among colleges. Summerskill found that in 35 institutional studies reviewed the retention rate varied from 12 per cent to 82 per cent. He writes:

> The existence of this very considerable variability provides an interesting but unexploited opportunity for comparative research in colleges selected for high and low attrition rates.

Similarly, Knoell stresses the need for a repetition of the Iffert (1957) study "with major attention given to institutional variance associated with retention and withdrawal rates."

Although many thoughtful and well-designed studies of college retention have been conducted only meager information is available concerning the factors associated with the able student's dropping out of college. Bridgman (1960) estimates that for the country as a whole over half of the college entrants are drawn from high school graduates below the top 30 per cent ability level. Since most previous attrition studies have been concerned with the entire entering freshman class, a considerable portion of the institutional variance in retention rates is no doubt due to variations in admissions standards. The fact that the present sample of Merit examinees included only students who ranked roughly in the top third of the 11th grade scholastic aptitude distribution is, of course, an advantage rather than a limitation if the purpose is to discover ways of reducing talent loss.

Appendix D shows that the samples of Merit examinees enrolling at individual colleges were small and were not necessarily representative of all academically talented students at these institutions. Nonetheless it is possible to consider each college subgroup as being exposed to at least a sample of the college's pressures and activities. We may then ask: What happens, during the initial years of college, to students in each of these subgroups? Are there differences in the extent to which they remain in the college of first registration? Are these differences related to the kinds of press they perceive their teachers and fellow students exerting? It was hoped that answers to these questions would give some indication of the effects of different learning environments, and would suggest ways of reducing talent loss during the undergraduate period.

Withdrawal and Retention Rates

In the following discussion withdrawal and persistence rate refer to student attributes, while retention rate refers to a college attribute. For example, the percentages of men and women dropping out of college before completing two years in normal progression are examples of withdrawal rates. However, when students are classified by the college attended and we consider the percentage of college's examinees completing two years in normal progression, such percentages are retention rates.

The distinction between withdrawal (or persistence) rates and retention rates closely parallels two kinds of analyses to be presented--those using students as the unit of sampling and those using colleges as the unit of sampling (cf. Tables 54 and 55). In the former we ask whether withdrawal or persistence rates are greater for men than women, for students reporting relatively "weak" vs. relatively "strong" press for achievement, etc. In the latter we ask whether the college's retention rate (among Merit examinees) is related to the proportion of males enrolled, the average press score (on a given scale) reported by the college's examinees, etc. Results from these two types of analyses may be expected to differ somewhat. For one thing, in an analysis using the student as the unit of sampling we weight observations on students equally, while in an analysis using the college as the unit of sampling we weight observations on colleges equally, even though some colleges enrolled more than 10 times the number of examinees that others enrolled. Another reason for discrepancies between the two modes of analysis is that the student samples involved differed slightly, as indicated below.

Retention survey. Appendix G shows a copy of the follow-up questionnaire mailed in June, 1961 to each of the 21,778 examinees who reported they had enrolled in college immediately as full-time students. Some of these students were asked to complete both the retention questionnaire and the Inventory of College Characteristics, while others were asked to complete only the former. Approximately 71 per cent, or 15,477, of these students completed the retention questionnaire. In contrast, only 65 per cent, or

7,167, of the 10,998 examinees attending the 140 selected colleges completed the questionnaire. Presumably the poorer returns from students enrolling in these colleges was due to the fact that about seven out of every 10 had been asked to complete both questionnaires.[1]

In general, analyses using the student as the unit of sampling are based upon the group of 15,477 respondents, while analyses using the college as the unit of sampling are based upon the group of 7,167 respondents. Data on college press were, of course, based only upon the 4,330 students who completed the Inventory of College Characteristics.

Response biases in the retention survey. Table 47 summarizes response bias associated with sex and aptitude level. At each aptitude level a greater proportion of women than of men responded, and the over all response rate among women (75.6 per cent) was significantly greater than that for men (67.0 per cent). In addition, students with high aptitude test scores responded more frequently than those with low test scores; 82 per cent of the examinees ranking at the 95th percentile or higher replied, while only 65 per cent of the examinees at the lowest aptitude level replied. These biases are similar to those already described for responses to the Inventory (Table 44).

Withdrawal rates. One out of every four of the students replying failed to complete the first two years of college in normal progression at the institution of first registration. Some of those who withdrew, however,

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[1] It will be recalled that whenever a college had enrolled more than 60 examinees only a random sample of 60 students was selected to receive the survey including the Inventory of College Characteristics (cf. Chapter 11).

Table 47

Response Bias Associated with Sex and Aptitude Level (Retention Survey in June, 1951)

NMSQT percentile equivalent (relative to 11th grade national norms	Men			Women			Total		
	Number and percentage of students*								
	D.S.	A.S.	A.S. as a % of D.S.	D.S.	A.S.	A.S. as a % of D.S.	D.S.	A.S.	A.S. as a % of D.S.
64-79	4088	2499	61.1	3671	2571	70.0	7759	5070	65.3
80-84	1387	774	55.8	1313	869	66.2	2700	1643	61.9
85-89	1626	1058	65.1	1420	1050	73.9	3046	2108	69.2
90-94	2322	1689	72.7	1935	1639	84.7	4357	3328	76.4
95 +	2398	1898	79.1	1618	1400	86.5	4016	3298	82.1
	11,821	7,918	67.0	9,957	7,529	75.6	21,778	15,447	70.9

* D.S. = Designated sample, or all examinees enrolling as full-time college students in Fall, 1959; A.S. = Analyzed sample, or all examinees returning useable returns to the retention survey.

transferred to other institutions. If we consider attendance relative to any college or university, we see in Table 48 that only about 16 per cent of these students actually had not completed two years of college at the time of the retention survey.[2]

There is little evidence of sex differences in withdrawal rates: the percentages completing two years at the college of initial registration are identical, while the percentages completing two years at any institution are very similar (83.2 vs. 84.7 per cent for men and women, respectively).

Withdrawal rates vary moderately with aptitude level. Only about 17 per cent of the examinees having test scores equivalent to the 95th percentile or higher withdrew from the college of first registration, while almost 30 per cent withdrew among students whose test scores placed them in the 64th to 80th percentile range. At the lower ability levels men tended to withdraw more frequently than women, while at the highest ability levels women withdrew somewhat more frequently than men (Table 49).

Retention rates. Among the 7,167 respondents who had entered the 140 selected colleges and universities, privately-controlled institutions had a significantly greater retention rate than publicly-controlled institutions: 84 per cent of the students going to private colleges, while only 76 per cent of those going to public colleges, completed the freshman and sophomore years in normal progression. In view of the kinds of students

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[2] Since students were asked to indicate only whether they had transferred to a new college (not when), it was impossible to determine the length of time transfer students attended the college of first registration. Hence no breakdowns by length of attendance strictly comparable to those reported by Iffert (1957) can be made.

Table 48

Withdrawal Rates of Examinees During the Freshman and Sophomore Years of College

Period of Attendance	Men	Women	Total
I. Attendance at Institution of First Registration			
Less than two years	24.1	24.0	24.0
Completed two years in normal progression	75.5	75.5	75.5
Others (unclassified)	.4	.5	.5
Total number of students	7,918	7,529	15,447
II. Attendance at Any Institution of Higher Learning			
One semester or quarter	2.4	2.5	2.5
More than one term, but not more than one year	5.5	7.1	6.3
More than one year, but less than two years	8.5	5.2	6.9
Completed two years in normal progression	83.2	84.7	83.9
Others (unclassified)	.4	.5	.4
Total number of students	7,918	7,529	15,447

Table 49

Withdrawal Rate by Sex and Aptitude Level
(Relative to institution of first registration)

NMSQT percentile equivalent	Number of examinees*	Percentage not completing two years by June, 1961
I. Women		
64-79	2561	28.0
80-84	867	22.6
85-89	1044	23.5
90-94	1628	23.1
95 +	1392	19.5
Totals	7,492	24.1
II. Men		
64-79	2485	30.5
80-84	770	26.1
85-89	1052	25.5
90-94	1685	21.8
95 +	1893	16.4
Totals	7,885	24.1
III. Men and Women		
64-79	5046	29.2
80-84	1637	24.3
85-89	2096	24.5
90-94	3313	22.5
95 +	3285	16.7
Totals	15,377	24.1

* Does not include 70 students who could not be classified with respect to continuance in college.

enrolled by private and public colleges, which we have already considered in Chapter 10, this difference in retention rates is not surprising.

Despite the fact that we are dealing with a narrower range of talent than is usually considered in institutional studies, the individual college retention rates among these examinees ranged from 50 to 98 per cent. Table 50 shows the distribution of retention rates for the 140 colleges. The four institutions having the highest retention rates were Harvard, The University of Rochester, The University of Pennsylvania, and Yale.

Reasons for Withdrawal and Transfer

Student explanations. Iffert's (1957) study indicates considerable variation in the reasons men and women give for dropping out of college: men most often cite lack of interest in studies; women most often cite marriage. An analysis of Merit examinees' reasons for discontinuing college confirms these findings. Table 51 shows that the four most popular reasons for discontinuance among men were, in order of frequency of mention, "lacked interest in my studies," "financial difficulties (self)," "dismissed for academic failure," and "military service (enlisted)." Among women the four reasons cited most often were, in order of popularity, "married or planning to be married soon," "financial difficulties (self)," "financial difficulties (family)," and "lacked interest in my studies." Of particular interest is the infrequency with which students cited reasons classifiable as "dissatisfaction with college." Clearly very few examinees attributed their discontinuance to dissatisfaction with teachers, fellow students or curriculum offerings. On the other hand, a sizeable number checked reasons which indicate a lack of motivation for college, and it

Table 50

Retention Rates Among 7,167 Merit Examinees at 140 Colleges

Per cent of examinees who had completed 2 years at institution of first registration in June, 1961	Number of institutions	Per cent of institutions with given retention rate
96 - 100	6	4
91 - 95	12	9
86 - 90	20	14
81 - 85	26	19
76 - 80	32	23
71 - 75	18	13
66 - 70	11	8
61 - 65	6	4
56 - 60	5	4
51 - 55	2	1
46 - 50	2	1
TOTAL	140	100

Median percentage retained - 79.5%

Table 51

Reasons for Withdrawal from College
(Examinees not completing two years of college in normal progression at any institution)

Response to "If you discontinued college, check the one or two most important reasons for withdrawing from college."	Per cent checking given reason		
	Men (N=1,299)	Women (N=1,117)	Total (N=2,416)
Marriage			
Married or plan to be married soon.	5.1	33.0	18.0
Financial difficulties			
Financial difficulties (self)	15.3	11.0	13.3
Financial difficulties (family)	8.5	10.4	9.4
Lack of motivation for college			
Lacked interest in my studies	15.7	10.0	13.0
Preferred to take a full-time job	2.7	9.9	6.0
Academic deficiencies			
Dismissed for academic failure	9.9	2.5	6.5
Discouraged by low grades	5.2	2.4	3.9
Placed on probation for academic reasons	3.1	.8	2.0
Found college work too difficult	.7	.8	.7
Military service			
Military service (enlisted)	9.8	.3	5.4
Military service (was drafted)	.5	---	.3
Dissatisfaction with college			
Dissatisfied with curriculum offerings	2.9	3.0	2.9
Dissatisfied with college faculty	.9	1.6	1.2
Dissatisfied with student associates	.7	1.1	.9
Illness, etc.			
Illness or physical disability (self or family)	3.5	4.7	4.0
Was needed at home	1.1	1.1	1.1
No response or unclassified	41.1	31.6	36.7

is possible that such reactions were a function of the kinds of college press to which the students had been exposed.

Reasons cited for transfer to another college also have relevance to the question of whether it is reasonable to expect a relationship between variance in withdrawal or retention rates and perceived college press. Table 52 summarizes the reasons given by students who either transferred before the end of the sophomore year or planned to transfer the following fall. Although the reason cited most often was completion of a junior college curriculum, reasons classifiable as "dissatisfaction with college" were clearly next in order of popularity. Unfortunately, about half of the "transfer" students whose responses are described in Table 52 were students who had not yet transferred (they planned to do so at the beginning of the next academic term). These students' intentions were not reflected in our withdrawal and retention rates, which were based only on actions taken before June, 1961.

Academic deficiencies. Have these students underestimated the frequency with which they actually withdrew from college because of academic deficiencies? Since no attempt was made to check with the registrars of colleges we cannot be sure, but an analysis of the consistency of responses to separate items in the retention questionnaire does not provide any evidence of such a tendency. For example, if we assume that none of the students checked more than one of the four "academic deficiency" reasons in Table 51 it may be estimated that 13 per cent, or about 300, of the 2,416 students withdrawing from college cited academic deficiencies as a primary reason. Two additional

Table 52

Reasons for Transfer from College of Initial Registration

Response to "If you have transferred or are planning to transfer this fall from the institution of your original registration to another college, what were the one or two most important reasons for transfer?"	Per cent checking given reason*		
	Men (N=1,747)	Women (N=1,747)	Total (N=3,461)
Completion of course			
Enrolled in a junior college and completed my course	23.1	19.0	21.0
Dissatisfaction with college			
Dissatisfied with curriculum offerings	15.7	19.5	17.6
Dissatisfied with faculty	7.0	6.0	6.5
Dissatisfied with student associates	4.4	5.8	5.1
Financial considerations			
Wished to attend less expensive institution	13.4	15.3	14.4
Desire for different training or environment			
My curricular interests changed	11.9	9.3	10.6
Wanted to be in a larger institution	8.6	12.4	10.5
Wanted to be nearer home	7.4	12.1	9.8
Was not interested in what I was studying	7.1	2.6	4.9
Wanted to be in a smaller institution	4.4	3.8	4.1
Academic deficiencies			
Grades were too low to continue	7.0	2.1	4.5
No response or unclassified	9.8	7.0	8.4

* Of the students whose responses are summarized, 51.3 per cent had transferred during the first two years of college, while 48.7 per cent planned to transfer to a new college in Fall, 1961.

questionnaire items asked: "Were you ever placed on probation in college for unsatisfactory academic performance?" and "If yes: were you able to improve your grades sufficiently to be taken off probation?" It may be supposed that students will be less inclined to answer these questions falsely than the question about reasons for withdrawal. Table 53 shows that 3,706 students completing less than two years at the college of first registration indicated whether they had been placed on probation, and of these 980 said they had. Though only about 90 per cent of the latter students answered the second question, 526 said they were able to improve their grades enough to be taken off probation. The remaining 454 (those not replying or saying "No" to the second question) represent approximately 12 per cent of all the students withdrawing from the college of first registration, a percentage that agrees fairly well with that obtained from the question about reasons for withdrawal.

Comparisons of the academic performance of examinees withdrawing from college and of those continuing indicate that the former had poorer academic records. Forty per cent of the students dropping out, while only 31 per cent of those continuing, had grade point averages of 2.5 or lower (an average grade midway between B and C). Similarly, 26 per cent of the dropouts, as compared with 13 per cent of the continuing students, said they had been placed on probation for unsatisfactory academic performance. Furthermore, once on probation the dropouts were less successful in improving their grades: 41 per cent of the dropouts, while only 16 per cent of the continuing students, said they had raised their grades sufficiently to be taken off probation.

Table 53

Indices of Academic Performance of Dropouts and of Students Completing Two Years (Relative to institution of first registration)

Index of academic performance	Retention group[1]	Number of respondents to item		Percentages and group differences			
		Men	Women	Men		Women	
				%	% diff.	%	% diff.
Per cent having grade-point averages of 2.50 or lower for last semester in college[2]	2 years	5,928	5,640	37.0		25.0	
	less than 2 years	1,875	1,801	54.8	17.8**	31.9	6.9**
		7,803	7,441				
Per cent placed on probation for unsatisfactory academic performance	2 years	5,928	5,610	17.0		8.9	
	less than 2 years	1,908	1,798	37.8	20.8**	14.4	5.5**
		7,836	7,388				
Per cent of those placed on probation who did not raise grades enough to be taken off probation	2 years	940	456	16.9		14.9	
	less than 2 years	666	227	41.9	25.0**	38.8	23.9**
		1,606	683				

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[1] 70 students for whom it was impossible to determine whether two years of college had been completed were classified as if they had discontinued school.

[2] Students were asked to report GPA's in terms of a system of grade equivalents where A=4, B=3, C=2, D=1, F=0.

** $p < .01$

The reported reasons for withdrawal or transfer suggested that men more often withdrew from college because of academic deficiencies than women. Results in Table 53 confirm this sex difference in academic performance. Men had lower grade-point averages, were more often placed on academic probation, and once on probation were less frequently able to raise their grades enough to be taken off probation. This sex difference cannot be attributed to differences in aptitude test scores, since the analyzed sample of men had slightly higher test scores than the analyzed sample of women (for example, in Table 47 it can be seen that 24 per cent of the men as compared with 18.6 per cent of the women had test scores equivalent to the 95th percentile or higher).

Student Characteristics Related to Persistence and Retention

Retention rates. We saw in Chapter 10 that colleges differ considerably with respect to characteristics of the Merit examinees they enroll; it was therefore expected that much of the observed variation in retention rates would be associated with these input differences. Table 54 shows that these expectations were confirmed. The correlations shown in the last column of this table were calculated by correlating the percentage of a college's examinees exhibiting a given attribute with the percentage completing two years in normal progression. Although each of the 11 attributes examined was significantly related to retention, some attributes clearly were more highly related than others. The three attributes most highly predictive of retention were the median NMSQT score (.48), the percentage planning to seek graduate or professional training at the time of entry (.48), and the percentage saying they chose their college because of its "high educational standards" (.40). We have already seen that there is little evidence of a sex difference in attrition rates, yet Table 54 shows that the percentage of males enrolled had a small but significant correlation (.23) with retention. Presumably this correlation is due to small retention differences among colleges very deviant in the percentage of male examinees enrolled. Women's colleges in our sample had only a 10 per cent lower average retention rate than colleges for men, but because these colleges were so deviant they exercise a disproportionate effect upon the correlation.

How accurately can we predict the college's retention rate among its high-ability enrollees, knowing just these 11 input characteristics? The answer is indicated by the multiple correlation of .58 between retention rate and an optimally weighted combination of these input (or predictor) characteristics. In other words, about one-third of the variance in college retention rates is associated with these student characteristics.

Persistence rates. While there should be some agreement among analyses using the college as the unit of sampling and those using the student as the unit of sampling, for reasons already discussed no exact correspondence can be expected. Table 54 (col. 1) shows tetrachoric correlation coefficients relating students attributes and the attrition index in which the student was the unit of sampling. It can be seen that these correlations were relatively low, and only six of the 11 attributes were significantly related to persistence. The three student attributes which were the best predictors of college retention were

Table 54

Correlations between Student Attributes and Attrition Indices (Attrition relative to institution of first registration)

Student attribute at beginning of college	Attrition Index Persistence rate[a] (1)	Retention rate[b] (2)
NMSQT score equivalent to national percentile rank of 86 or greater[c]	.18**	.48**
Planned to seek grad. or professional degree	.14**	.48**
Chose college on basis of its "high educational standards"	.09**	.40**
Family could pay $800 or more per year for college costs	.07*	.33**
Father attended college	.02	.33**
Attending college as resident	.11**	.26**
Held freshman scholarship	.20**	.25**
Mother attended college	.03	.25**
Male	.00	.23**
Attending college more that 50 miles from home	.06	.19*
Held or planned to hold part-time job in college	--•	-.19*

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[a] Tetrachoric r's calculated from four-fold tables(presence or absence of attribute vs. completion or non-completion of two years of college.) Results based upon a 20 per cent random sample of all respondents to the retention survey.

[b] Product-moment r's relating the percentage of the college's enrollees with the given attribute and the percentage completing two years of college. Results based only upon data from 7,167 respondents attending 140 selected colleges.

[c] Median NMSQT score of enrollees at college used in Col. 2.

• No estimate made of correlation. * $p < .05$. ** $p < .01$.

also significantly related to student persistence; similarly, the three attributes having the lowest positive correlations with retention rates had low and insignificant correlations with persistence.

College Press Related to Persistence and Retention

Is the student who reports an unusually strong college press of a given kind more or less likely to persist? To answer this question, the 4,330 respondents to the Inventory of College were dichotomized on the basis of their responses to each press scale. On each scale students with scores above the score boundary most closely approximating the median score for all students were placed in a "strong press" group, while those with scores below this boundary were placed in a "weak press" group. Tetrachoric correlations were then computed from the observed persistence rates exhibited by these groups. The first column of Table 55 shows that 11 of the 14 press scales were significantly related to persistence. The students most likely to complete two years of college in normal progression were those who had reported strong student press for intellectualism (.18), strong faculty press for affiliation (.15) and independence (.10), or weak faculty press for directiveness (-.16).

How well does the average press score reported by students at a given college predict the college's retention rate? The second column of Table 55 shows that average scores on 11 of the 14 press scales had statistically significant correlations with the retention criterion. It will be recalled, however, that seven of these scales had high positive loadings, and two (Vocationalism and Compliance) had high negative loadings, on a single common factor (cf. Chapter 11). Hence the press scales cannot be considered independent measures. Therefore, considering only the factors described earlier, it appears that Factors I and IV are both associated with high retention rates, i.e., colleges whose students report strong Humanistic Press and strong student press for Competition are likely to have somewhat higher retention rates. Factor III (Warmth of Human Relations) also appears positively related to retention, though not as highly related since only one of the two scales loading highly on this factor had a significant correlation with retention.

Finally, we consider the question of whether knowledge of the college's press increases the accuracy with which we can predict its retention rate (i.e., permits us to predict which colleges will have unusually high or low retention rates in view of the pre-college characteristics of their examinees). For this purpose an "index of holding power" was computed for each of the 140 colleges. This index, which represents a residual error of estimate, was the observed retention rate minus the rate predicted on the basis of the multiple regression equation relating the retention criterion to an optimally weighted combination of the 11 input characteristics discussed in Table 54. Colleges having high index values are those retaining a greater proportion of their examinees than we would expect on the basis of their input characteristics, while those with low index values represent colleges retaining a smaller proportion than we would expect in view of the characteristics of their enrollees. Table 56 summarizes the correlations between these indices (residuals) and average scores on each of the 14 college press scales.

If we compare these correlations with those shown in the last column

Table 55

Correlations between College Press and Attrition Indices (Attrition relative to institution of first registration)

College press reported by student(s)	Attrition Index Persistence rate[a] (1)	 Retention rate[b] (2)
Factor I		
Reflectiveness (S)	-.09**	.41**
Estheticism (S)	.03	.35**
Intellectualism (S)	.18**	.40**
Independence (F)	.10**	.39**
Humanism (F)	.09**	.33**
Enthusiasm(F)	.08**	.37**
Achievement (F)	-.07*	.36**
Vocationalism (F)	-.02	-.39**
Compliance (F)	-.10**	-.34**
Factor II		
Supportiveness (F)	.06*	.10
Affiliation (F)	.15**	.27**
Factor III		
Social conformity (S)	-.02	-.02
Factor IV		
Competition (S)	.12**	.41**
Factor V		
Directiveness (F)	-.16**	.13

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[a] Tetrachoric r's based only on data from 4,330 students who completed the Inventory of College Characteristics. Students were classified in four-fold tables by presence or absence of perception of strong press (i.e., a press stronger than the average for all students) and by completion or non-completion of two years of college.

[b] Product-moment r's relating the college's average press score and the per cent of the college's enrollees completing two years of college (based upon 140 colleges).

* $p < .05$

** $p < .01$

of Table 55 it can be seen that the effect of partialling out college input characteristics is to reduce the correlations with retention rates, although for one scale (press for Social Conformity, which may be better called press for Social Sophistication) the effect is to increase the correlation. Only three of the press scales were significantly related to the index of holding power. Colleges having unusually high retention rates were those at which examinees reported that the faculty exerted strong press for Humanism and Enthusiasm, and that their fellow students exerted strong press for Social Sophistication.

How should these results be interpreted? First, it is clear that the correlations in Table 56 generally do not confirm the hypothesis that the present college press scales have validity for predicting which colleges will have unusually high or low retention rates. As a consequence this analysis yields few suggestions concerning modifications in teaching practices which might be made to increase the retention of high-ability students. On the other hand, these results should not be interpreted as strong evidence refuting the hypothesis either. It is possible that relationships of greater magnitude would be found if larger student samples were followed up for longer periods of time. Larger student samples would, of course, increase the reliability of both the predictor and criterion variables. It was not possible to estimate the reliability of the retention criterion used here, but if it was not much greater than .58 then the absence of relationships could be due to the fact that there simply was not enough reliable variance left for the college press scales to predict. Also high-ability students who drop out of college during the junior and senior years

Table 56

College Press Scales as Predictors of Colleges with Unusually High or Low Retention Rates

College press scale	Correlations between mean press score and index of holding power[a] (based on measures of 140 colleges)
Factor I	
Reflectiveness (S)	.09
Estheticism (S)	.11
Intellectualism (S)	.14
Independence (F)	.13
Humanism (F)	.21*
Enthusiasm (F)	.18*
Achievement (F)	.01
Vocationalism (F)	-.08
Compliance (F)	-.01
Factor II	
Supportiveness (F)	.06
Affiliation (F)	.17
Factor III	
Social conformity (S)	.20*
Factor IV	
Competition (S)	.08
Factor V	
Directiveness (F)	-.04

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[a] The index of holding power represented residual errors of estimate (i.e., the observed college retention rate minus the rate predicted on the basis of a multiple regression equation for predicting retention rates from an optimally weighted combination of each of the 11 college input characteristics shown in Table 54).

* $p<.05$.

may well do so for different reasons than those dropping out earlier. We have seen that Merit examinees dropping out of college during the freshman and sophomore years most often attribute their discontinuance to marriage, financial difficulties, or to a lack of interest in studies, while relatively few said they withdrew because they were dissatisfied with their college teachers or fellow students. However, in the earlier discussion of reasons for transferring out of the college of first registration, we noted that a considerable number of students expressed dissatisfaction with their college, though about half of those citing reasons planned to transfer during the next academic term. Unfortunately these intentions were not expressed early enough to be reflected in the retention rates used here. In short, the present data neither clearly confirm nor refute the hypothesis that institutional variance in retention rates among high-ability students is a function of differences in college press.

Chapter 13

CHANGES IN PLANS TO SEEK ADVANCED TRAINING

The analysis to be reported in this chapter was undertaken to discover factors which influence the decisions of college students to continue their education in graduate or professional schools. If we can discover manipulable features of college environments which affect the student's motivation for advanced training, then it will be possible to suggest steps that colleges might take to increase the extent to which they stimulate, enhance, and further the careers of promising young scientists, scholars, and artists.

Chapter 11 briefly reviewed earlier studies which suggest that some colleges are more successful than others in motivating students to seek advanced training, and that these differences are, in part, traceable to faculty behaviors and activities. First, it has been shown that colleges differ in the percentages of their graduates who are later listed in American Men of Science (Knapp & Goodrich, 1952), or who later give evidence of becoming promising scholars (Knapp & Greenbaum, 1953). Secondly, it has been found that the faculties at institutions whose graduates attain the PhD in greater numbers than would be expected on the basis of the aptitudes of their entering classes are perceived differently than the faculties at less productive institutions (Thistlethwaite, 1959d, 1959e). Thirdly, students who retrospectively judge they have raised their degree aspirations during college typically report having been exposed to different college press than students who judge they have not changed, or have lowered, their aspirations (Thistlethwaite, 1960, 1962). Finally, some students making the decision to seek graduate or professional training during the college years attribute their decision to the influence of college teachers (Gropper & Fitzpatrick, 1959; Stecklein & Eckert, 1961). On the whole, these studies provide suggestive, if not definitive, evidence that college learning environments shape in some degree the student's motivation for advanced training.

Since all of the studies so far reported on college productivity, or on changes in motivation for advanced training, have been based upon correlational data, there remains a reasonable doubt about the validity of any causal hypothesis advanced as an explanation for the observed relationships. Alternative interpretations of the foregoing results are possible, and have been proposed by a number of investigators. For example, the results of Knapp and his associates, it is argued, may reflect differences between colleges predictable on the basis of the sex, aspirational, or other personality characteristics of the institution's entering classes (Stuit, Helmstadter, & Fredericksen, 1956; Holland, 1957; McConnell & Heist, 1959). More recently, Astin (in press) has argued that Thistlethwaite's results (1962) are vitiated by inaccuracies in the student's retrospective recall of his degree aspirations at the beginning of college, and by the method of analysis used (covariance analysis).[1] Other rival hypotheses for explaining the results of earlier studies are discussed in Chapter 11.

While it is possible to progressively narrow the number of plausible rival hypotheses for explaining the apparent "effects" of different learning environments, there is no way--short of random assignment of subjects to different educational treatments--to rule out all rival, causal hypotheses. McKeachie

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[1] Thistlethwaite (in press) replied by citing some of the analyses to be reported in this chapter which appear to rule out the specific rival hypotheses suggested by Astin.

(1962) has recently reviewed short-term experiments in which investigators assigned students to different sections of the same college course and then manipulated the teaching methods used by instructors. Such experiments are useful in evaluating different teaching methods, but exposure to such isolated treatments can hardly be expected to have decisive effects upon the students' educational goals. McKeachie observes that "no matter how powerful one's impact, it is asking a great deal to expect it to have noticeable effects in sixteen weeks." Since it is difficult to imagine any college setting in which investigators have the opportunity to randomly assign students to long-term educational treatments (i.e., to different student and faculty "cultures") further resolution of these questions must rely upon an accumulation of relatively weak tests of the most plausible rival hypotheses.

In the following we shall report correlational tests of the hypothesis that variations in learning environments cause differences in motivation for advanced training, and shall suggest what appear to be the most plausible alternative interpretations of the observed relationships.

Changes in Level of Aspiration

Individual differences. Each examinee was asked to indicate the highest level of education he planned to complete--both in Fall, 1959 when he first entered college and again in June, 1961 when he had completed two years of college.[2] Table 57 summarizes changes in aspirations during this period.

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[2] In this analysis we shall consider only the data from examinees who returned the Inventory of College Characteristics (cf. p. 218). Among these respondents 117 students, who either failed to complete two years of college or did not report their initial or final degree aspirations, were excluded.

Although the net proportions of men and women planning to seek a graduate or professional degree increased only slightly during this interval (increases from 35 to 41 per cent for women, and from 62 to 65 per cent for men), upward and downward shifts in aspirations were frequent. If we consider the Doctorate (PhD or EdD) and professional degrees (M.D., D.D.S., LL.B., etc.) to represent comparable levels of aspiration and the Master's, Bachelor's, and "some college" to represent successively lower levels of aspiration, then four out of every 10 students either raised or lowered their aspirations during this period.

Women differed from men both with respect to initial and final level of aspiration (men planned to seek advanced training more frequently), but the sexes did not differ noticeably in the frequency with which they raised or lowered their goals. Thus 23 per cent of the women and 22 per cent of the men raised their aspirations, while 17 per cent of the women and 19 per cent of the men lowered their aspirations.

Undoubtedly the magnitude of differences in "change" scores for subgroups of students is attenuated when we consider only the changes in aspirations occurring during the early college years. Cropper & Fitzpatrick (1959), who asked a large sample of undergraduate seniors when they made their decisions to seek, or not to seek, graduate training, found that 48 per cent made their decisions during the third or fourth year of college, while only 27 per cent made their decisions during the first or second year. Similar results were obtained by the author who studied the advanced training decisions of finalists in the first National Merit Scholarship program. Among these students, who had completed college at the time of the survey, 52 per cent

Table 57

Changes in the Highest Level of Education Students Planned to Complete

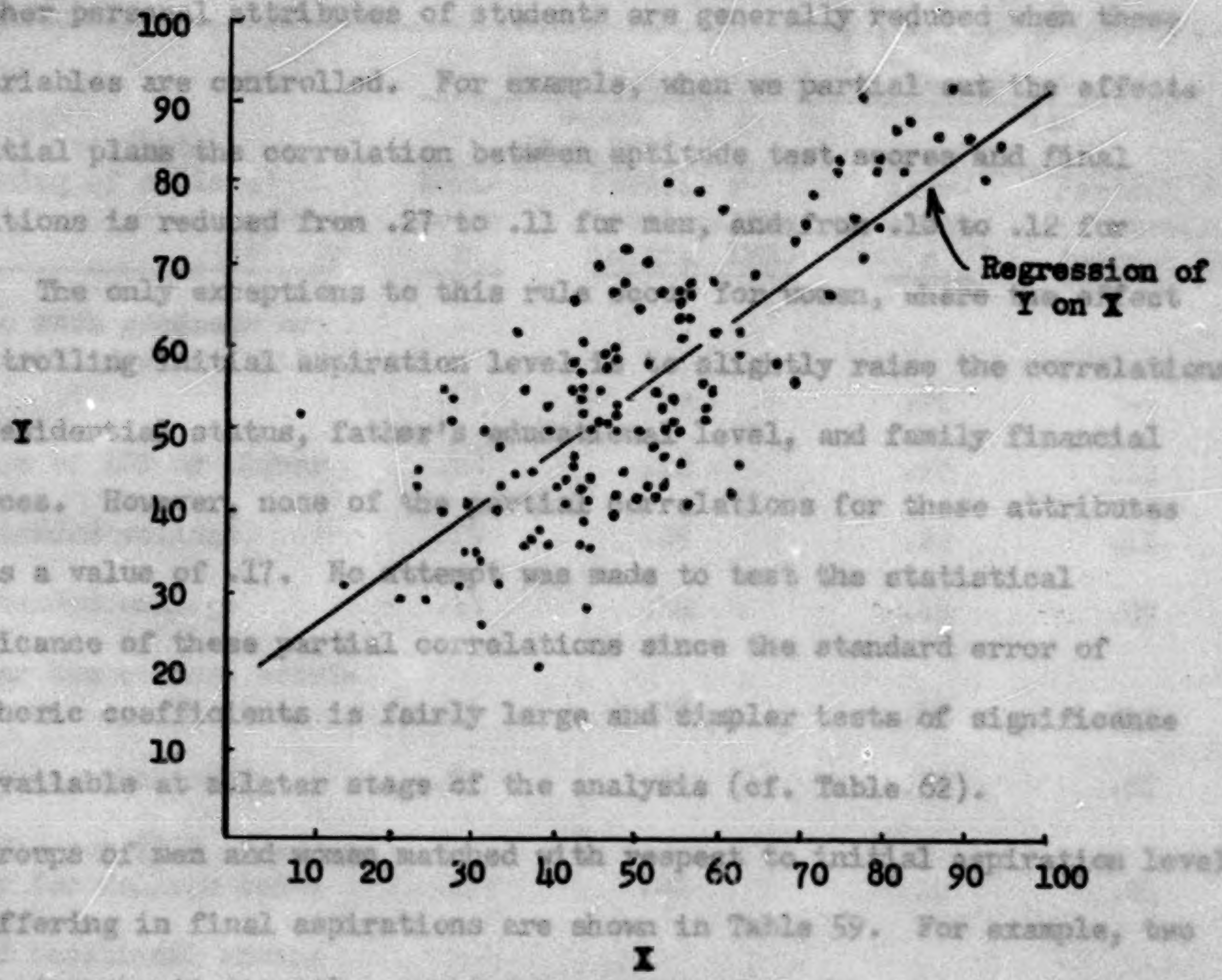
Initial aspiration in 1959	Number of students	Per cent with given aspiration in 1959	Per cent with each aspiration after two years				
			Some college (1)	Bachelor's (2)	Master's (3)	Prof. degree (4)	Doctorate (5)
I. Women							
1. Some college	90	5	16	72	11	1	--
2. Bachelor's	1088	60	4	67	26	2	1
3. Master's	465	26	2	32	60	2	4
4. Prof. degree	82	4	1	39	28	26	6
5. Doctorate	84	5	2	20	36	4	38
Totals	1,809	100	4	55	34	3	4
II. Men							
1. Some college	33	1	12	70	6	9	3
2. Bachelor's	894	37	3	59	24	8	6
3. Master's	559	23	--	29	44	13	14
4. Prof. degree	516	22	1	11	16	58	14
5. Doctorate	402	17	1	9	22	10	58
Totals	2,404	100	2	33	26	21	18

reported they made their decisions during the third or fourth year of college, while only 14 per cent said they made their decisions during the first two years of college. In limiting the present study to the first two undergraduate years we are dealing with a population in which many students have made only minimal changes in aspirations, hence the variance of "change" scores will be markedly reduced compared to those of students who have completed college. Consequently the more crucial tests of the hypothesis that college press influences student degree aspirations will be among groups which differ sufficiently in rates of change to permit the expected relationships to appear. As the next section shows, college differences in the rates at which examinees changed their aspirations were generally small. For this reason, and others which are discussed later, most of the statistical analyses were performed using the student as the unit of sampling.

College differences. When we consider the college as the unit of sampling there are a few sizeable differences between colleges in the rate at which students changed their aspirations. For example, at one college the percentage planning to seek graduate or professional training increased from nine to 52 per cent over the two-year interval, while at another college the percentage planning to seek advanced training decreased from 38 to 21 per cent over the same interval. But generally the proportion of the college's examinees planning to seek advanced training after two years was highly predictable from the proportion with such plans at the start of college. A scatter-plot of these proportions is shown in Figure 23, where each college is represented by a dot. Colleges represented by dots above the regression line in this figure had students who on the average had higher final aspirations for advanced training than we would expect on the basis of their plans at the start of college, while those represented by dots below the regression line had students with lower final aspirations than we would expect in view of their initial plans. The correlations between the X and Y values shown in this figure is .77; in other words, about 60 per cent of the variance between colleges with respect to the proportion planning to seek advanced training after two years is associated with differences in the aspirations of students at the time they entered college.

Isolation of matched groups. In order to test the hypothesis that college press accounts for some of the individual differences in motivation for advanced training, it was desirable to isolate subgroups differing with respect to changes in plans but relatively homogeneous with respect to related background traits. We have already seen in Table 57 that sex and initial aspiration level account for a considerable portion of the variance between subjects in final plans to seek advanced training. Thus 65 per cent of the men, but only 41 per cent of the women planned, after two years of college, to seek graduate or professional degrees; the tetrachoric correlation between sex and final degree plans was .35. Similarly, among students entering college with plans to complete no more than the Bachelor's degree only 32 per cent later planned to seek advanced degrees, while among those entering college with plans to seek advanced training 78 per cent reported such plans after two years. Among men the tetrachoric correlation between initial and final plans was .64, while among women the correlation was .57. Table 58 indicates that of the 10 background traits considered the student's initial degree aspiration was clearly the best predictor of his later aspirations.

By controlling sex and initial aspirations level it is possible to



Legend:

X--Per cent of college's examinees planning to seek advanced training at the beginning of college.

Y--Per cent of college's examinees who, after two years of college, planned to seek advanced training.

Fig. 23 Changes in Aspirations of 4,213 Merit Examinees Enrolled at 140 Colleges.

isolate groups which are relatively homogeneous with respect to other personal attributes. Table 58 shows that the correlations between final aspirations and other personal attributes of students are generally reduced when these two variables are controlled. For example, when we partial out the effects of initial plans the correlation between aptitude test scores and final aspirations is reduced from .27 to .11 for men, and from .18 to .12 for women. The only exceptions to this rule occur for women, where the effect of controlling initial aspiration level is to slightly raise the correlations with residential status, father's educational level, and family financial resources. However, none of the partial correlations for these attributes exceeds a value of .17. No attempt was made to test the statistical significance of these partial correlations since the standard error of tetrachoric coefficients is fairly large and simpler tests of significance were available at a later stage of the analysis (cf. Table 62).

Groups of men and women matched with respect to initial aspiration level but differing in final aspirations are shown in Table 59. For example, two groups of women (I and I') who initially planned to seek only the Bachelor's degree were segregated: the first group consisted of those who did not change, or who lowered, their aspirations during the two year interval, while the second consisted of those who raised their aspirations during the same interval. In general, the matched subgroups in Table 59 are designated by the same Roman numeral, and the prime designates the subgroup with the higher final aspirations.

How should one classify a student who entered college planning to seek a professional degree but later decided to seek a Ph.D., or a student who

Table 58

Personal Attributes as Predictors of Degree Aspirations After Two Years of College

Personal attribute (at beginning of college)	Correlation with terminal aspirations*			
	Women (N=1,809)		Men (N=2,404)	
	Zero-order r	Partial r (controlling initial LOA)	Zero-order r	Partial r (controlling initial LOA)
Planned to seek graduate or professional degree (initial LOA)	.57	---	.64	---
NMSQT score of 109 or higher	.18	.12	.27	.11
Mother attended college	.05	.05	.22	.12
Father attended college	.13	.14	.18	.09
Applied for two or more scholarships	.16	.08	.15	.05
Held freshman scholarship	.09	.03	.15	.01
Family could pay $800 or more per year for college costs	.07	.08	.14	.04
Considered vocational choice final or definite	-.06	-.12	.09	.04
Attending college as resident	.08	.17	.04	.05
Attending college more than 50 miles from home	-.07	-.02	.01	.01

* Tetrachoric correlations

Table 59

Description of Student Groups Matched on Initial Degree Aspirations but Differing in Changes in Aspirations

Matched group	LOA[a]		Number of students	Direction of change in LOA[b]
	1959	1961		
		A--Women		
I	2	1-2	773	-,0
I'	2	3-5	315	+
II	3	1-2	158	-
II'	3	3-5	307	0,+
III	4	1-3	56	-
III'	4	4-5	26	0,+ (?)
IV	5	1-4	52	- (?)
IV'	5	5	32	0
Others (excluded)	1	1-5	90	
Totals			1,809	
		B--Men		
I	2	1-2	553	-,0
I'	2	3-5	341	+
II	3	1-2	161	-
II'	3	3-5	398	0,+
III	4	1-3	141	-
III'	4	4-5	375	0,+ (?)
IV	5	1-4	167	- (?)
IV'	5	5	235	0
Others (excluded)	1	1-5	33	
Totals			2,404	

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[a] Code numbers for each level of aspiration (LOA) correspond to those shown in Table 57.

[b] The signs -, 0, and +, respectively, indicate that the terminal LOA was lower than, the same as, or higher than the initial LOA. Question marks reflect reservations about how a change from plans to seek the M.D., D.D.S. (or similar professional degree) to plans to seek a Ph.D., or the reverse change, should be classified.

exhibited the reverse change? For the purposes of this analysis the Doctorate was considered a higher level degree than the M.D. (or other professional degree), though it is recognized that this rule is somewhat arbitrary. Question marks in the last column of Table 59 indicate the groups containing students classified on the basis of this rule. Approximately one third of the men in group IV and one fourth of those in group III' exhibited shifts among the two highest levels of aspiration.

College Press and Motivation for Advanced Training

By sorting the groups according to change in aspirations, as in Table 59, and then examining these groups for press variables that differentiate those affected in one way from those affected in another way, we have one method of testing the hypothesis that college press influences degree aspirations. If we find that the press scales differentiate between groups in the expected manner we shall have evidence confirming the hypothesis. A second method of testing the hypothesis, more analogous to an experimental test, consists in identifying groups which are extreme with respect to the independent variables (reported college press) and then examining these groups for differential change in aspirations. If we find that the groups exposed to those kinds of press expected to raise student aspirations have in fact raised their aspirations more than the groups exposed to the reverse kinds of press, we shall have evidence confirming the hypothesis. Both modes of analysis are reported in the following sections. However, before considering the results it is desirable to describe the specific relationships expected between college press and changes in motivation for advanced training.

Hypothesized effects of different college press. It will be recalled from the discussion in Chapter 11 that items were selected for each press scale on the basis of their power to discriminate between criterion groups similar to the matched groups just described. In general it was expected that the same relationships found among these criterion groups, drawn from 1,072 Merit finalists (Thistlethwaite, 1962), would be found among the subgroups drawn from this sample of Merit examinees ranking roughly in the top third of the aptitude distribution. On this basis it was predicted that high scores on all of the scales loading highly on factors I, II, III, and V (with the exception of the Vocationalism and Compliance scales) would be associated with increases in motivation for advanced training, and that high scores on the Competition scale (factor IV) and on the Vocationalism and Compliance scales (which loaded negatively on factor I) would be associated with decreases in motivation for advanced training.

College press reported by students showing different changes in aspirations. In Tables 60 and 61 the average press scores on each scale have been compared for each of the matched groups. Here we sought to determine whether the groups of men and women with higher final aspirations reported different kinds of college press than the matched groups with lower final aspirations. Only the t-values used in evaluating the statistical significance of the mean differences in press scoress are shown in these tables. A positive t-value indicates that the mean press score for the group with higher final aspirations was greater, while a negative t-value indicates that the mean press score for the group with lower final aspirations was greater. Combined tests of significance, summing t-values over the initial aspirations, are shown in the last column of each table.[3]

It can be seen in Table 60 that the results for men generally confirm the hypotheses. If we consider the overall relationships shown in the last column of this table we see that the direction of the differences are as predicted for every scale except the Competition scale, and that on 10 of the 13 scales which differentiated in the expected manner the differences were statistically significant.

The individual t-values show that faculty and student press were virtually unrelated to changes in aspirations of men who entered college with plans to seek the Doctorate, while college press was highly related to changes in aspirations of men who entered college with plans to seek professional degrees or lower-level degrees. Among the latter, exposure to faculty and student subcultures characterized by Humanistic Press (factor I) and by Warmth of Human Relations (factor II) is generally associated with increases in aspirations.

Failure to find the expected relationships among men who entered college with plans to take the Ph.D. was probably not due to the fact that subgroup IV contained some men who had changed from plans to seek the Doctorate to plans to seek professional degrees (cases difficult to classify), since most of the differences for these subgroups were in directions contrary to those predicted. It appears that students who enter college hoping to take the Ph.D. are influenced in a different manner than men who do not enter with such plans. For example,

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[3] These t-values were calculated by a method described by Mosteller and Bush (1954, p. 330) which permits one to weight the t-values in proportion to the sizes of the subgroups.

Table 60

Comparison of Average Press Scores of Men Showing Different Changes in Aspirations
(Data from 2,371 men enrolled at 140 selected colleges)

Press scale	Value of t for significance of difference between mean press scores of matched groups[a] Initial LOA (reported in Fall, 1959)				Combined test of significance (combining t's over initial levels)
	Bachelor's I vs. I'	Master's II vs. II'	Prof. degree III vs. III'	Doctorate IV vs. IV'	
Factor I					
Reflectiveness(S)	+ .80	+1.41	+1.88	- .63	+1.78
Estheticism(S)	+ .24	+3.58**	+2.54*	- .50	+2.67**
Intellectualism(S)	+1.89	+4.83**	+1.79	- .21	+4.22**
Independence(F)	+2.88**	+5.16**	+2.57*	+ .05	+5.60**
Humanism(F)	+4.32**	+4.17**	+4.19**	- .48	+6.50**
Enthusiasm(F)	+2.32*	+3.75**	+1.67	- .17	+4.00**
Achievement(F)	+1.98*	+2.47*	+2.02*	- .74	+3.13**
Vocationalism(F)	- .95	+ .05	-2.45*	- .65	-1.89
Compliance(F)	-6.35**	-1.63	-1.97*	- .83	-6.40**
Factor II					
Supportiveness(F)	+2.36*	+2.30*	+2.14*	- .69	+3.39**
Affiliation(F)	+3.17++	+3.32**	+ .30	+ .11	+3.95**
Factor III					
Social conformity(S)	+ .01	+1.21	+ .37	-1.02	+ .38
Factor IV					
Competition(S)	+3.33**	+ .73	+1.25	-4.31**	+1.85
Factor V					
Directiveness(F)	+ .52	+4.57**	+1.68	-2.73**	+2.26*

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[a] Signs of t values are for the differences obtained by subtracting the mean for subjects having the same or lower terminal LOA (gps. I, II, III, or IV) from the mean for subjects having higher terminal LOA in 1961 (gps. I', II', III', or IV'). In general a positive sign indicates that the given press was associated with increases in aspirations, while a minus sign indicates the given press was associated with decreases in aspirations.

* $p < .05$
** $p < .01$

strong student press for Competition is negatively related to increases in aspirations among the former, but positively related to such increases among the latter. There appears to be a similar interaction between initial aspiration level and the effects of strong faculty press for Directiveness.

In contrast to these results for men, the comparisons of the female subgroups shown in Table 61 generally did not confirm the hypotheses. Considering the last column of this table we see that only the Vocationalism and Compliance scales significantly differentiated between subgroups in the expected manner. The individual t-values suggest that among women entering college with plans to take the Master's degree, Humanistic Press (factor I) and Warmth of Human Relations (factor II) tend to help these students to maintain or to raise their goals. However, the results for women with different goals at the start of college are generally insignificant. These results are consistent with those reported by Thistlethwaite (1962) for National Merit finalists; in that study similar college press scales predicted changes in the aspirations of men, but did not predict changes in the aspirations of women. In retrospect, the present results are also not particularly surprising in view of the method of selecting items for the revised press scales which involved four pairs of male criterion groups but only two pairs of female criterion groups (chapter 11).

Changes in aspiration among students exposed to different college press. The second method of testing the hypothesis that learning environments influence motivation for advanced training involves the comparison of changes in plans among students selected for extremeness with respect to exposure to the independent variables (college press). For each scale students were assigned

Table 61

Comparison of Average Press Scores of Women Showing Different Changes in Aspirations
(Data from 1,719 women enrolled at 140 selected colleges)

Press scale	Value of t for significance of difference between mean press scores of matched groups[a] Initial LOA (reported in Fall, 1959)				Combined test of significance (combining t's over initial levels)
	Bachelor's I vs. I'	Master's II vs. II'	Prof. degree III vs. III'	Doctorate IV vs. IV'	
Factor I					
Reflectiveness(S)	+ .85	+ .38	+ .69	-1.21	+ .89
Estheticism(S)	- .03	+2.16*	+ .90	-1.82	+ .75
Intellectualism(S)	-1.06	+2.14*	+1.67	- .66	- .08
Independence(F)	- .40	+2.68**	+1.36	- .82	+ .71
Humanism(F)	- .20	+3.17**	+ .17	-2.54*	+ .89
Enthusiasm(F)	- .34	+2.56*	+1.33	-2.22*	+ .62
Achievement(F)	- .39	+1.60	- .20	-1.42	+ .16
Vocationalism(F)	-2.05*	-2.20*	- .83	-1.42	-2.90**
Compliance(F)	-3.49**	-2.11*	- .90	- .72	-4.13**
Factor II					
Supportiveness(F)	-1.13	+2.32*	- .08	-1.02	- .20
Affiliation(F)	- .38	+2.13*	+2.16*	+1.20	+ .71
Factor III					
Social conformity(S)	- .78	- .40	- .84	-2.93**	-1.12
Factor IV					
Competition (S)	-1.23	- .64	- .60	- .22	-1.44
Factor V					
Directiveness(F)	-1.09	+1.24	- .01	- .89	- .58

[a] See footnote a, Table 60.

* $p < .05$
** $p < .01$

to a "strong" or "weak" press group according to whether the student's score fell above or below the interval limit most closely approximating the median press score for all students on that scale. The code numbers for each level of aspiration shown in Table 57 were then treated as if they constituted an interval scale, and the average final aspiration level for "strong" and "weak" press groups were compared. Differences between groups with respect to initial aspirations were controlled by covariance analysis.

The results, which are shown in Tables E-3 and E-4 of Appendix E, closely paralleled the overall tests of relationships we have just considered. Both analyses (Tables 60 and E-3) show that increases in aspirations among men were associated: (a) extreme scores on seven of the nine factor I scales (i.e., with strong student press for Estheticism and Intellectualism, with strong faculty press for Independence, Humanism, Enthusiasm, and Achievement, and with weak faculty press for Compliance), and (b) with high scores on both of the factor II scales (i.e., with strong faculty press for Supportiveness and Affiliation). The second analysis did not confirm the positive relationship with faculty press for Directiveness (factor V) but did suggest a significant positive relationship with student press for Reflectiveness and a negative relationship with faculty press for Vocationalism. Similarly, the second method of testing the hypothesis of environmental effects upon women's motivation for advanced training generally confirmed the results in Table 61. Both analyses show that strong faculty press for Compliance is associated with decreased motivation for advanced training, and that eleven of the remaining types of college press have no noticeable effects upon the goals of women. The second analysis did not confirm the negative relationship with faculty press for Vocationalism, but did indicate a positive relationship with faculty press for Affiliation.

These results demonstrate that the relationships found are not specific to the method of analysis used, and suggest that learning environments do shape in some degree the student's motivation for advanced training.

Individual Differences and Motivation for Advanced Training

Are there alternative interpretations for explaining the apparent effects of college press upon student goals? It will be recalled that controlling sex and initial aspiration level generally reduced the correlations between final aspiration level and other personal attributes, but that a few of the partial correlations in Table 58 indicated that there might still be residual relationships between final aspirations and personal attributes. Accordingly, each of the matched subgroups which differed appreciably in average press scores were compared with respect to those personal attributes having the largest partial correlations with final aspirations. Table 62 summarizes t-values for the significance of the differences between the proportions of each group exhibiting each of the seven most relevant personal attributes. Positive t-values indicate that a greater proportion of the group with higher final aspirations had the given attribute, while negative t-values indicate that a greater proportion of the group with lower final aspirations had the attribute.

Among women who entered college planning to seek the Master's degree, those who maintained or raised their aspiration levels had higher aptitude scores than those who lowered their aspiration levels. Consequently an alternative interpretation of the results we have just considered in Table 61 is that the higher ability women more often felt they were competent to do graduate work, and therefore less frequently lowered their goals. It is also necessary to suppose that the higher ability women tended either to participate in different student and faculty subcultures than their less talented peers, or that they were exposed to similar subcultures but perceived their teachers and fellow students differently.

It is apparent that similar interpretations may be made from the differences in personal attributes between the matched groups of men shown in Table 62. Thus the male groups having the higher final aspirations not only tended to report stronger college press on scales loading positively on factors I and II but also tended to have higher test scores, more often had parents who went to college, and more frequently applied for scholarships.

In short, there are plausible alternative interpretations for explaining the apparent effect of college press upon student goals. Explanation by one set of factors (environmental vs. individual difference variables) is not necessarily more parsimonious than explanation by the other, and of course these alternative explanations are not mutually exclusive. Both may be true. However, one important difference lies in their respective implications for action. If we interpret these results as indicating that certain kinds of college press cause some students to raise their aspirations for advanced training, then it appears that colleges interested in improving their "productivity" can take steps to increase the extent to which they encourage students to seek advanced training. These results suggest that faculty members should be encouraged to exhibit the kinds of demands, images, and pressures defined by scales loading highly and positively on factors I and II. There seems to be

Table 62

Personal Attributes of Students Showing Different Changes in Aspirations

	Value of t for significance of difference between proportions of matched groups exhibiting given attribute [a]			
	Initial LOA (reported in Fall, 1959)			
Personal attribute (at beginning of college)	Bachelor's	Master's		Prof. degree
	I vs. I' (Men)	II vs. II' (Men)	II vs. II' (Women)	III vs. III' (Men)
NMSQT score of 108 or greater	+3.91**	+4.00**	+2.66**	+2.01*
Mother attended college	+3.85**	+2.15*	+1.15	+4.98**
Father attended college	+2.80**	+ .06	+ .75	+3.29**
Applied for two or more scholarships	+2.13*	+2.63**	+ .74	+1.16
Family could pay $1000 or more per year for college costs	+1.31	+ .44	- .39	+2.89**
Considered vocational choice final or definite	-1.57	- .65	- .64	+2.14*
Attending college as resident	+1.83	+ .93	-1.22	- .69

[a] N's for groups are shown in Table 59.

* $p < .05$
** $p < .01$

little risk in making such efforts, and there may well be a pay-off in terms of reduced talent loss for the nation. On the other hand, if we interpret these results as merely indicating that final degree aspirations are determined solely by pre-college characteristics, then colleges can do little or nothing about encouraging their undergraduates to seek advanced training. To be sure, colleges might improve their "productivity" by more rigorous selection of students. However, such steps are not likely to result in reduced talent loss for the nation. On the contrary, an overly zealous tightening of admissions standards might produce greater talent loss, particularly if the variables used in selection are not excellent predictors of achievement motivation.

Such considerations imply that in searching for ways to reduce talent loss priority should be assigned to manipulable features of the environment. McClelland in the volume, Talent and Society, asks the somewhat embarrassing question, "Identification for what?" We all agree that identification of the individual difference variables that predict future achievement is desirable, but what do we propose to do with the potentially talented person after we have identified him? How should one manipulate the environment so as to maximize his productivity? As long as we remain preoccupied with identification studies and neglect to give adequate attention to the effects of different training procedures we cannot hope to do justice to the task of encouraging talented young men and women to seek appropriate training. Because of the importance of this task we shall describe more specifically the kinds of college press which seem most highly related to changes in motivation for advanced training.

Faculty and Student Behaviors Related to Changes in Aspirations

As we have seen the college press scales loading highly and positively on factors I and II are associated with increased motivation for advanced training, while those loading highly and negatively (Vocationalism and Compliance) on factor I are associated with decreased motivation for such training. The salient features of such press are best defined by citing representative items from each of these scales. Table 63 shows such items from each of the 11 scales loading highly on these factors. To illustrate the astonishingly large differences between institutions with respect to faculty and student press the proportions answering each item "True" are shown for two groups of students: those enrolled at the 12 colleges with the lowest, and those enrolled at the 12 colleges with the highest, scores on factors I and II. (The letters "T" or "F" in parentheses after each statement indicate the responses keyed positively in deriving total scale scores.)

On many of the items in this table the difference in the percentages of these two groups saying the statement was "True" of their college exceeded 50 per cent. These differences are persuasive evidence that faculty and student subcultures differ markedly from college to college. The items themselves provide the most precise description of the demands, pressures, and behaviors of teachers and fellow students that seem to encourage students to seek advanced training; additional description of these behaviors may be obtained by examining Table E-1 in Appendix E.

The Prediction of Differences in College Productivity

Indices which assess the extent to which a college's graduates show

Table 63

Differences in Perceived Press at Selected Colleges and Universities

Representative items from press scales with high loadings on Factors I and II	Percentage of student observers responding "True" to item among enrollees at:		
	12 colleges with low scores on two factors (398 students)	12 colleges with high scores on two factors (209 students)	Per cent diff.
Factor I scales			
Student press for Reflectiveness			
Books dealing with psychological problems or personal values are widely read and discussed. (T)	14	63	49
Students here have very little interest in the analysis of value systems, and the relativity of societies and ethics. (F)	59	11	58
Student press for Estheticism			
There is a lot of interest here in poetry, music, painting, sculpture, architecture, etc. (T)	23	79	56
A lecture by an outstanding poet or dramatist would draw very few students here. (F)	55	5	50
Student press for Intellectualism			
Students here rarely get excited about a campus speaker. (F)	64	16	48
Most of my associates admire their teachers. (T)	37	85	48
Faculty press for Independence			
There is little opportunity here for pursuing independent study under the supervision of faculty members. (F)	57	7	50
The college rarely encourages students to undertake independent projects or theses. (F)	54	7	47
Faculty press for Humanism			
Very few of the professors here try to get students interested in the humanities. (F)	63	4	59
Professors here show no interest in tracing the sources of their specialized field of study to philosophical or humanistic movements in the history of ideas. (F)	57	6	51

Table 63--Continued

Item	12 colleges with low scores	12 colleges with high scores	Per cent diff.
Faculty press for Enthusiasm			
Faculty members put a lot of energy and enthusiasm into their teaching. (T)	42	84	42
Professors typically exhibit great interest and enthusiasm in their subjects. (T)	48	88	40
Faculty press for Achievement			
Teachers here expect, and usually get, excellence in the academic performance of students. (T)	28	81	53
The student can pass most courses just by learning what's in the textbook. (F)	76	49	27
Faculty press for Vocationalism			
The college offers many really practical courses designed to prepare the student for his occupation. (T)	87	29	58
Most instructors are very practical and pragmatic in their approach to college training. (T)	72	33	39
Faculty press for Compliance			
Instructors often waive requirements for admission to their courses. (F)	13	62	49
The faculty often permits students to deviate somewhat from published curriculum requirements in their course work. (F)	41	68	27
Factor II scales			
Faculty press for Supportiveness			
Teachers are sensitive to student complaints and grievances and frequently try to remedy the situation. (T)	48	78	30
Students having difficulty with their courses can easily get special tutoring or counsel from the departments' instructors. (T)	55	75	20
Faculty press for Affiliation			
Instructors seem personally interested in their students. (T)	31	74	43
The faculty here takes a personal interest in students and their work. (T)	33	76	43

unusual achievement motivation or intellectual attainments have been called "productivity" indices (Knapp & Goodrich, 1952; Knapp & Greenbaum, 1953). Although we cannot speak of the "graduates" of the 140 colleges and universities represented in our sample, it seemed that it might be possible to study the relative impacts of different colleges upon the plans of Merit examinees during the early college years.

The hazards of ranking colleges with respect to the quality of undergraduate instruction are well known. We have already cited a number of investigators who have stressed the need for controlling differences in student quality among institutions so that comparisons of institutions on the basis of the attainments of their graduates will not merely reflect such initial diversities. Consequently in the analysis to be described we have attempted to take account of a large number of college input characteristics which seemed relevant to the college's output.

Table 64 summarizes the correlations between each of 11 college input characteristics and the proportion of the college's examinees planning to seek advanced training at the end of the sophomore year. It can be seen that the average initial aspiration level of the college's students is clearly the best predictor of later goals. Average aptitude test scores and the proportion saying they chose the college because of its "high educational standards" are the next best predictors of final aspirations. On the other hand, the proportion holding part-time jobs, distance from home, and residential status were virtually unrelated to the criterion. In view of the magnitude of the relation between initial and final plans (.766) one would not expect the multiple correlation between the criterion and predictions based on an optimally

Table 64

College Input Characteristics as Predictors of Final Student Aspirations
(Analysis using college as unit of sampling)

College input characteristic	Correlation between percentage of college's enrollees planning to seek advanced training in June, 1961 and given college attribute	Partial regression coefficient in multiple-regression equation[a]
% planning to seek advanced training in Fall, 1959	.766	.583
Median NMSQT score of enrollees	.562	.048
% choosing college on basis of its "high educational standards"	.480	.003
% whose fathers attended college	.368	.053
% whose families could pay $800 or more per year for college costs	.346	.186
% holding freshman scholarships	.343	.208
% male	.295	-.008
% whose mothers attended college	.270	-.063
%attending college as residents	.080	.175
% attending college more than 50 miles from home	-.018	-.232
% holding or planning to hold part-time jobs in college	-.020	-.020

[a] Multiple R relating the proportion planning advanced training in June, 1961 to the proportion predicted on the basis of the 11 input characteristics was .807 (N=140 colleges).

weighted combination of these input variables to be much higher. Table 64 shows that taking the additional characteristics into account only raise the correlation to a negligible degree (.807).

Finally, we consider the question of whether knowledge of the college's press increases the accuracy with which we can predict its "productivity" (i.e., permits us to predict which colleges will have unusually high or low productivity rates in view of the pre-college characteristics of their examinees). For this purpose an index of college productivity was computed for each college. This index, which is a residual error of estimate, was simply the proportion of students with final plans to seek advanced training minus the proportion predicted on the basis of the 11 student input characteristics just described. Table 65 summarizes correlations between this index and average college press scores for the 140 institutions. It can be seen that none of the correlations were statistically significant.

Although these results appear to contradict the earlier interpretations based upon analyses using the student as the unit of sampling, a closer examination reveals that the discrepancies can be attributed to anomalies peculiar to the analysis using the college as the unit of sampling. First, while there are large college differences in faculty and student press, there were relatively few differences between colleges with respect to the rate at which students changed their aspirations during the period of this study. We have already cited evidence which indicates that only minimal changes in motivation for advanced training occur during the first two undergraduate years. On these grounds we would of course consider the more crucial test of the hypothesis of environmental effect to be found among groups differing sufficiently in rates of change to permit the effects to appear. Secondly, as we have seen variations

Table 65

College Press Scales as Predictors of Colleges with Unusually High or Low Final Student Aspirations

College press scale	Correlations between mean press score and index of college productivity[a] (based on measures of 140 colleges)
Factor I	
Reflectiveness (S)	.00
Estheticism (S)	-.03
Intellectualism (S)	.00
Independence (F)	-.01
Humanism (F)	.06
Enthusiasm (F)	-.07
Achievement (F)	-.04
Vocationalism (F)	-.09
Compliance (F)	.03
Factor II	
Supportiveness (F)	.08
Affiliation (F)	.09
Factor III	
Social conformity (S)	-.04
Factor IV	
Competition (S)	.03
Factor V	
Directiveness (F)	-.05

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[a] The index of college productivity represented residual errors of estimate (i.e., the proportion of the college's examinees planning to seek advanced training in June, 1961 minus the proportion predicted on the basis of an optimally weighted combination of the input characteristics).

in college press are related to changes in degree aspirations among men, but are largely unrelated to such changes among women. Unfortunately the average number of examinees enrolled at each of the 140 colleges was too small to permit breakdowns by sex at each college. One consequence of pooling the data for both sexes is to make the results shown in Table 65 somewhat noncomparable to the other results. In other words, treating the college as the unit of sampling made it impossible to adequately take account of the interaction effects suggested between sex and college press. Finally, in characterizing the degree aspirations of a college's enrollees by such a crude index as the "proportion with initial plans to seek advanced training" it is clear that we do not do justice to the interaction effects suggested in Table 60 between initial aspiration level and college press.

On the whole, these results indicate that the interpretation of differences in college productivity is indeed a complex and hazardous task. If the research objective in such studies of college productivity is to identify those features of learning environments most conducive to the development of talent it appears that this objective may be better approached by analyses to find out "who changes."

Summary

We have seen that undergraduates (particularly, men) raising their degree aspirations during the first two years of college report different college press than students who do not raise their aspirations. One interpretation of these results is that faculty and student subcultures characterized by strong Humanistic Press and by Warmth of Human Relations cause some students to aspire to graduate and professional degrees, while the reverse kinds of press discourage them from such aspirations. However, we have also seen that students showing increases in aspirations tend to differ in other respects from those not showing such increases. The former tend to have higher average aptitude test scores, more often have parents who attended college, and more frequently applied for scholarship aid. Hence these and other differences in the personal attributes may also have caused the observed changes in aspirations. Since the present correlational data do not permit us to rule out one or the other of these two broad explanations (the environmental vs. the individual differences intepretations) it may be tentatively concluded that both are plausible, and not necessarily mutually exclusive, explanations of the results. Though both explanations are consistent with our results, they differ with respect to their implications for college teachers and administrators. The interpretation in terms of environmental effects suggests a number of steps which colleges may take to encourage students to seek advanced training, and these steps may well help to reduce talent loss during the undergraduate years.

Chapter 14

SUMMARY

A problem of continuing concern to educators and scientists is that of conserving and developing the nation's supply of potentially talented young men and women. Both idealistic and practical reasons argue for a persistent attack upon the problem of talent loss. The discrepancy between the basic ideal of a free society that all citizens shall have equality of educational opportunity and the fact that a lack of money now prevents many of our talented youth from realizing their potentialities is disturbing. Our need to replenish the nation's supply of educated talent in this Age of Science and of international tensions provides additional justification for the development of knowledge about ways of encouraging more potential college entrants to seek appropriate training.

This study has attempted to evaluate the effectiveness of a variety of recruiting and training incentives by studying factors related to the educational decisions of potential college entrants. For this purpose a follow-up was made of a 10 per cent random sample of some 300,000 examinees taking the 1958 National Merit Scholarship Qualifying Test. All of these examinees had graduated from high school and had test scores which placed them roughly in the top third of ability relative to national norms for 11th grade high school students. Examinees were surveyed both at the time they would normally enter college and again when the would normally have completed the first two undergraduate years.

The current loss of high ability youth to higher education is hardly a cause for satisfaction. A conservative estimate of talent loss among Merit examinees who have shown an interest in college is that one out of every six ranking in the upper 30 per cent of ability fail to enroll in college immediately. The greatest loss occurs among women,low-income and low-ability groups, and among students living in the North Central region of the country. In the South the greatest loss of talent occur during the high school years, while in other regions there is less loss during the high school years but greater loss during the transition from high school to college. These results suggest that high school teachers and counselors more often represent the critical gate-keepers in the South, and that incentives designed to encourage college attendance are not likely to have their maximum impact unless the holding power of secondary schools in many states is improved.

Talent loss in the top five per cent of each year's supply of potential college entrants appears to be relatively small. Only about one out of 23 of the men and one out of 13 of the women at this aptitude level did not enter college as full-time students. However, a much more significant loss occurs among those who rank in the next five percent in aptitude. Here the loss is about one out of 10 of the men and one out of five of the women.

Among the 50,000 examinees estimated to have dropped out of school following high school graduation the most frequent reason (cited by four out of 10) was inability to pay college costs. Over half of the dropouts say they would go to college if they had more money. A more optimistic estimate, based upon the time at which these students said they decided not to go to college, is that perhaps 80 per cent of the men and 75 per cent of the women could have been recruited into college if incentives had been provided as early as the junior year of high school.

Students dropping out of school appear to be ambivalent towards loans as means of financing college. Although half of the dropouts said they would be willing to apply for a federal loan if they needed help to pay college costs, only three per cent reported they had actually applied for college loans. It seems likely that loans present negative as well as positive images to students, and that they will prove to be less effective than scholarships as means of reducing talent loss.

Do offers of scholarship aid actually recruit students into college who would not otherwise enroll? Our results suggest that they do. When we control aptitude test scores, rank in high school class, amount of mathematics taken in high school, and such instrumental behaviors as applying for scholarships and loans, there still remains a significant positive correlation between exposure to a scholarship offer and college attendance. The most plausible explanation of these results is that scholarship offers cause some students to enroll in college who would not otherwise do so.

Though there are grounds for believing that scholarships can play an important role in reducing talent loss, a number of lines of evidence indicate that currently available scholarship funds are frequently not administered so as to maximize their effects upon recruiting qualified students who are undecided about entering college. First, there is great diversification in the control of scholarship resources, with the consequence that donors frequently compete against each other in offers of support to students with extremely high aptitude test scores. More than half of the scholarships awarded to this sample of examinees went to students ranking in the top decile of ability, and both the frequency of awards and the size of stipends increased sharply among students in the top five per cent of ability. Even though a large proportion of the existing scholarship-granting agencies might endorse the desirability of using scholarship funds to recruit uncommitted talent into higher education, there are limits to which donors can implement this policy. Thus colleges and universities are often under pressure to improve their talent supplies, and will support applicants for aid even though it is obvious that many of the recipients will attend some college regardless of whether or not they receive aid. Secondly, the fact that almost half of the stipends from scholarship foundations and over 40 per cent of those from private colleges and federal governmental agencies went to relatively well-to-do students also suggests that scholarships are often used to support students who are college-bound in any case. Thirdly, colleges and universities collectively control more than half of the existing scholarship resources and it is well known that colleges offer aid primarily to the student who has taken the instrumental step of applying for admission. However, students who are undecided about whether or not they should go to college, unfamiliar with college scholarship opportunities, or who are uncertain about their chances of securing aid, often fail to apply for admission. Consequently many of these students remain unexposed to offers of aid which might encourage them to continue their schooling. Clearly there is a need both for a coordinated national policy of talent development, and for additional scholarship resources to encourage talented students to continue their schooling.

An analysis of the effects of honorary awards for exceptional performance on college aptitude tests (e.g., the Letter of Commendation and the Certificate of Merit awarded by the National Merit Scholarship Corporation) indicates that while such awards increase the likelihood that the recipient will win a scholarship from other donors, it is primarily the well-to-do student who benefits in this respect. Consequently such honorary awards seem to have relatively little value as incentives for recruiting potential college students or for increasing their motivation for advanced training.

Fields of study differed markedly in their ability to recruit academically talented students as prospective majors. The physical sciences (physics, mathematics, and chemistry) ranked at the top, while physical education, agriculture, and business and commerce ranked at the bottom with respect to the average aptitude test scores of their prospective students. However, there is little or no evidence that differential subsidy (in the form of scholarships) accounted for these inequalities in the talent supplies of different fields of study. Students planning to major in music were unusually successful in winning scholarship aid (i.e., were successful more often than would be expected on the basis of their college aptitude test scores or high school ranks) but this can be attributed largely to their initiative in applying for aid or the inappropriateness of such scores and ranks as bases for awarding scholarships to music students.

The probability that high-scoring Merit examinees will enroll in privately-controlled colleges tends to increase with aptitude level, and rises sharply among students ranking in the top five per cent of ability. Two explanations which appear consistent with the results are that private colleges more often recruit (with offers of scholarship aid, etc.) students with outstandingly high test scores, and that as the aptitude level of the student increases he becomes increasingly likely to hold educational goals and values which he believes can be adequately satisfied only at a relatively few privately controlled colleges. The average aptitude test score of the college's enrollees has a correlation of .74 with the proportion of the college's enrollees saying they chose their college because of its "high educational standards." Although little is known about how students gain information about the relative quality of the incoming classes at various colleges, it seems that some students have fairly accurate pre-college notions about the educational standards of the colleges they select.

Methods used in constructing 14 scales for describing faculty and student subcultures at different colleges have been described. Items were selected on the basis of their power to differentiate between groups of students reporting different kinds of changes in degree aspirations during the undergraduate years. Though the scales had greater redundancy than was expected, at least five relatively independent dimensions of college press may be assessed with these scales. In a two-year follow up of examinees entering college the validity of each scale in predicting persistence in college and changes in motivation to seek advanced training was examined.

One out of every four of the Merit examinees enrolling in college withdrew from the institution of first registration before completing two years, and the withdrawal rate systematically rose with decreases in aptitude level. Although men and women dropped out of college at similar rates, men most often cited a lack of interest in studies, and women most often cited marriage, as the primary reasons for withdrawal. Financial difficulties in paying college costs were cited next most frequently by both men and women. Relatively few of the college dropouts gave as their reasons for withdrawal dissatisfaction with their college, though transfer students cited such dissatisfactions fairly often. The 14 college press scales do not help us appreciably in predicting which colleges will have unusually high or low retention rates but it is possible that the scales will have greater value in predicting retention rates among larger groups of students followed for longer periods of time.

The hypothesis that college press influences student motivation to seek advanced training was generally confirmed for men but not for women. One explanation of the results is that faculty and student subcultures characterized by strong Humanistic Press and by Warmth of Human Relations encourage some students to maintain or to develop aspirations to seek graduate or professional degrees. Such effects were most clearly observable among men who entered college planning to seek the B.A., M.A., or a professional degree, and among women who entered college planning to seek the M.A. An alternative explanation for the results is students showing increases in motivation for advanced training were initially more disposed to seek such training because of their somewhat higher aptitude test scores, the higher educational level of their parents, and because of their greater educational motivation as indicated by their tendency to apply for scholarships more frequently. Since the present correlational data do not permit us to rule out one or the other of these two broad explanations (environmental vs. individual difference interpretations) it may be concluded that both are plausible, not necessarily mutually exclusive, explanations of the results. A number of steps which teachers and college administrators may take to encourage undergraduates to seek advanced training are suggested by the college press scales which load highly on the factors called Humanistic Press and Warmth of Human Relations.

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Appendix A

SCHOOL AND REGIONAL DIFFERENCES IN PARTICIPATION OF SECONDARY SCHOOL GRADUATES IN THE 1958 NATIONAL MERIT SCHOLARSHIP QUALIFYING TEST

By means of the questionnaire sent to principals of all schools offering the test it was possible to estimate the number of NMSQT examinees who graduated from high school, and to compare this number with the total number of all 1959 graduates in the nation. Since returns were received from only about 90 per cent of the schools, the data permit us to set only lower boundaries on school and student coverage. Nonetheless, it is clear that the most important sources of bias in treating 1958 Merit examinees as a sample of all 1959 graduates arise from incomplete school participation and from voluntary or involuntary absence from the testing session in schools where the test was offered. Methods and sources of information used in assessing these biases are reported here; additional analyses undertaken to study other sources of bias are discussed in Chapter 2.

School Coverage

Since some 1959 graduates attended secondary schools which did not offer the Merit test, they did not have the opportunity to participate. School coverage can be estimated both by the percentage of schools offering the test and by the percentage of graduates attending schools in which the test was offered. As we shall see, coverage is much more comprehensive when estimated by the latter percentage than when estimated by the former.

Table A-1 presents data for estimating the proportion of public, Catholic, and other non-public secondary schools offering the Merit test. It should be noted that the participation of Catholic schools is probably underestimated since it was necessary to estimate the number of Catholic schools in 1957-58 from the number existing in Fall, 1960. Slightly less than half of all secondary schools offered the test, and the percentage of participation was less in public schools (45.9%) than in Catholic and other non-public schools (74.1 and 73.9%, respectively). Participation also varied considerably by state and geographical region. The highest rate of participation was observed among schools located in the North Atlantic region, the lowest among schools in the southeastern region. The five states in which the largest percentages of secondary schools participated were Vermont (82.6), Arizona (76.4), New Hampshire (76.1), Indiana (75.0), and Maine (72.8). At the other extreme, the five states having the smallest percentages of their schools participating were Alabama (14.2), Mississippi (21.9), Oklahoma (23.4), Arkansas (27.2), and Louisiana (31.9).

In estimating the proportion of all 1959 graduates who attended secondary schools offering the test, a major difficulty encountered was the lack of comprehensive statistics on the 1959 graduating class. Since the Office of Education did not collect detailed statistics on public secondary school graduates for 1958-59, it was necessary to estimate these frequencies by interpolation.[1] The number of graduates from participating schools was obtained from the survey of high school principals, but since returns were not received from all schools these estimates can only be considered approximate. In general, a moderately high degree of confidence can be placed in the estimates for public schools (Table A-2) and somewhat less confidence can be placed in those for Catholic schools (Table A-3). The only estimates of the number of graduates from other private schools available were those reported by principals of participating schools. Hence for these schools no estimate could be made of the percentage of 1959 graduates from non-Catholic private schools who had graduated from schools not offering the test. However, since there are few graduates from these private schools, relatively little error is made if we assume that all of these students attended schools offering the test.[2] The latter assumption was in fact made in preparing the total estimates reported in Chapter 2 (Table 5).

Thus, it is estimated that at least 85% of all 1959 graduates attended high schools offering the Merit test, and at least 84% of the graduates from public secondary schools came from participating schools.

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[1] I am indebted to Dr. Kenneth Simon, of the U. S. Office of Education, for suggesting the procedures described in footnote 3, Table A-2.

[2] In 1955-56 an estimated 13% of all pupils attended non-public elementary and secondary schools, and enrollment in Catholic schools generally accounted for about 90% of the total enrollment in non-public schools (Schloss and Foster, 1959, p.25). Extrapolating these percentages to high school graduates would lead us to predict that only 1.3% of the graduates from secondary schools in any given year came from non-Catholic private schools.

School coverage as measured by this index was also best in the North Atlantic and poorest in the southeast regions of the country.

Since 85% of all 1959 graduates attended participating schools while only 50% of all secondary schools participated, it can be inferred that the typical non-participating school tends to be one of relatively small enrollment. In view of the regional differences described it seems likely, moreover, that many of these schools are located in rural areas.

Voluntary and Involuntary Student Selection

The Merit qualifying test was available to any student unless the principal of the participating school decided otherwise. It is not known how many students were denied permission to take the test, hence it was not possible to estimate the loss in coverage attributable to voluntary and involuntary factors. Presumably students who wished to participate but who were not permitted to (the involuntary absentees) were in the opinion of their high school principals unlikely to qualify for scholarships. Voluntary absentees of course include all students who attended participating schools but who voluntarily elected not to take the examination. Approximately one-third (32.4%) of all 1959 graduates from secondary schools offering the Merit test were examined. Thus voluntary and involuntary selection factors eliminated two-thirds of the population of 1959 graduates from these schools.

Table A-4 summarizes the proportions of 1959 graduates in each state who were examined. This table indicates the cumulative effects of incomplete school coverage and voluntary or involuntary absence from the testing session. At least 27% of all 1959 graduates were examined, and the percentage tested varied by region from a high of 32.6% of the graduates in the North Atlantic region to a low of 20% of the graduates in the southeastern region. The five states with the largest percentages of their graduates tested were Rhode Island (39.1), Washington (37.1), Michigan (37.0), New Hampshire (35.9), and Delaware (35.7); while the five states with the smallest percentages of their graduates tested were Alabama (14.8), Mississippi (14.8), Arkansas (14.9), Oklahoma (17.5), and Louisiana (17.6).

Clearly Merit examinees cannot be considered representative of all graduates from secondary schools. In treating examinees as a sample of qualified and potential college entrants (as we have in Chapter 2) it is necessary to assume that the ratio of voluntary to involuntary absentees was extremely large and that voluntary absentees represent students predisposed not to enter college.

Table A-1

Participation of Secondary Schools in the 1958 National Merit Scholarship Qualifying Test, by State

State	Public Secondary Schools: No. of schools[1] (1)	Public Secondary Schools: No. of participating schools (2)	Public Secondary Schools: Participating schools as a percentage of (1) (3)	Catholic Secondary Schools: No. of schools[2] (4)	Catholic Secondary Schools: No. of participating schools (5)	Catholic Secondary Schools: Participating schools as a percentage of (4) (6)	Other nonpublic schools: No. of schools[3] (7)	Other nonpublic schools: No. of participating schools (8)	Other nonpublic schools: participating schools as a percentage of (7) (9)	Public and nonpublic Secondary Schools: No. of schools (10)	Public and nonpublic Secondary Schools: No. of participating schools (11)	Public and nonpublic Secondary Schools: participating schools as a percentage of (10) (12)
North Atlantic	4,292	2,371	55.2	877	670	76.4	550	404	73.5	5,739	3,445	60.2
Conn.	173	99	57.2	35	24	68.6	60	42	70.0	268	165	61.6
Dela.	48	26	54.2	10	5	50.0	7	7	100.0	65	38	58.5
Maine	183	123	67.2	17	16	94.1	39	35	89.7	239	174	72.8
Md.	252	112	44.4	46	33	71.7	31	25	80.6	329	170	51.7
Mass.	610	235	38.5	152	121	79.6	79	55	69.6	841	411	48.9
N. H.	93	72	77.4	19	12	63.2	22	14	63.6	134	102	76.1
N. J.	311	187	60.1	96	72	75.0	52	34	65.4	459	293	63.8
N. Y.	1,429	752	52.6	261	193	73.9	144	105	72.9	1,834	1,050	57.3
Pa.	998	658	65.9	194	155	79.9	77	56	72.7	1,260	869	68.5
R. I.	73	26	35.6	20	14	70.0	11	8	72.7	104	48	46.2
Vt.	83	70	84.3	11	7	63.6	15	13	86.7	109	90	82.6
D.C.	39	11	28.2	16	14	87.5	13	10	76.9	68	35	51.5
North Central	8,075	4,561	56.5	924	702	76.0	204	175	85.8	9,203	5,438	59.1
Ill.	925	558	60.3	149	112	75.2	41	32	78.0	1,115	702	63.0
Ind.	746	556	74.5	34	27	79.4	13	12	92.3	793	595	75.0

Table A-1 (Con'd)

State	Public Secondary Schools N (1)	N (Part.) (2)	% (3)	Catholic Secondary Schools N (4)	N (Part.) (5)	% (6)	Other nonpublic schools N (7)	N (Part.) (8)	% (9)	Public and nonpublic Secondary Schools N (10)	N (Part.) (11)	% (10)
Iowa	859	479	55.8	118	94	79.7	8	7	87.5	985	580	58.9
Kansas	654	286	43.7	33	25	75.8	14	11	78.6	701	322	45.9
Mich.	832	503	60.5	172	141	82.0	29	29	100.0	1,033	673	65.2
Minn.	603	390	64.7	69	49	71.0	14	12	85.7	686	451	65.7
Mo.	593	296	49.9	81	58	71.6	18	16	88.9	692	370	53.5
Neb.	483	255	52.8	46	35	76.1	8	6	75.0	537	296	55.1
N. D.	383	133	34.7	17	11	64.7	5	3	60.0	405	147	36.3
Ohio	1,141	632	55.4	134	103	76.9	28	23	82.1	1,303	758	58.2
S. D.	261	114	43.7	12	10	83.3	8	6	75.0	281	130	46.3
Wisc.	595	359	60.3	59	37	62.7	18	18	100.0	672	414	61.6
Southeast	7,447	2,470	33.2	319	213	66.8	233	161	69.5	7,999	2,845	35.6
Ala.	1,325	169	12.8	14	11	78.6	21	13	61.9	1,360	193	14.2
Ark.	679	175	25.8	14	12	85.7	3	2	66.7	696	189	27.2
Fla.	485	183	37.7	30	22	73.3	36	19	52.8	551	224	40.7
Ga.	616	231	37.5	10	9	90.0	20	14	70.0	646	254	39.3
Ky.	465	162	34.8	65	44	67.7	22	16	72.7	552	222	40.2
La.	601	164	27.3	89	51	57.3	12	9	75.0	702	224	31.9
Miss.	645	129	20.0	29	16	55.2	5	4	80.0	679	149	21.9
N. C.	910	381	41.9	11	7	63.6	26	20	76.9	947	408	43.1
S. C.	396	241	60.9	5	4	80.0	11	9	81.8	412	254	61.7
Tenn.	536	226	42.2	13	12	92.3	29	22	75.9	578	260	45.0
Va.	418	231	55.3	19	14	73.7	43	30	69.8	480	275	57.3
W. Va.	371	178	48.0	20	11	55.0	5	3	60.0	396	192	48.5

Table A-1 (Cont'd)

State	Public Secondary Schools			Catholic Secondary Schools			Other nonpublic schools			Public and nonpublic Secondary Schools		
	N (1)	(Part.) (2)	% (3)	N (4)	(Part.) (5)	% (6)	N (7)	(Part.) (8)	% (9)	N (10)	(Part.) (11)	% (12)
West and Southwest	5,693	2,298	40.4	368	262	71.2	179	117	65.4	6,240	2,677	42.9
Ariz.	85	66	77.6	11	9	81.8	14	9	64.3	110	84	76.4
Calif.	793	456	57.5	138	107	77.5	78	46	59.0	1,009	609	60.4
Colo.	385	179	46.5	21	14	66.7	14	9	64.3	420	202	48.1
Idaho	189	95	50.3	4	4	100.0	4	0	00.0	197	99	50.3
Mont.	187	120	64.2	15	12	80.0	1	0	00.0	203	132	65.0
Nev.	41	25	61.0	2	1	50.0	1	1	100.0	44	27	61.4
N. M.	173	63	36.4	21	10	47.6	10	9	90.0	204	82	40.2
Okla.	935	205	21.9	27	16	59.3	11	7	63.6	973	228	23.4
Ore.	271	168	62.0	23	16	69.6	7	4	57.1	301	188	62.5
Texas	1,930	587	30.4	74	48	64.9	24	21	87.5	2,028	656	32.3
Utah	148	52	35.1	5	4	80.0	3	3	100.0	156	59	37.8
Wash.	427	229	53.6	26	20	76.9	11	7	63.6	464	256	55.2
Wyo.	129	53	41.1	1	1	100.0	2	1	100.0	131	55	42.0
Outlying Parts	89	42	47.2	11	5	45.5	14	14	100.0	114	61	53.5
Alaska	32	18	56.3	4	0	00.0	1	1	100.0	37	19	51.4
Hawaii	57	24	42.1	7	5	71.4	13	13	100.0	77	42	54.5
Continental U. S.	25,507	11,700	45.9	2,488	1,847	74.1	1,166	857	73.2	29,161	14,405	49.4
Total 50 states plus D.C.	25,596	11,742	45.9	2,499	1,852	74.1	1,180	871	73.9	29,275	14,465	49.4

Footnotes for Table A-1

[1] Data from Schloss, S. and Hobson, Carol J., Statistical Summary of State School Systems 1957-58, Office of Education, U. S. Dept. of Health, Education, and Welfare, Circular no. 623, 1960.

[2] From an enumeration of existing Catholic secondary schools in Fall, 1960, provided by the National Catholic Welfare Conference. Since the number of Catholic high schools for the year 1958-59 was 2,320, and for the school year 1959-60 was 2,390, it seems likely that the above enumeration is an overestimate of the number of schools existing in 1957-58. This results in an underestimate of the percentage of Catholic schools participating in the Merit program.

[3] Based primarily upon a count of all non-Catholic secondary schools offering 11th and 12th grade instruction and listed in The Handbook of Private Schools. (Boston, Mass.: Porter Sargent, 1959); This enumeration yielded 923 schools; an additional 257 participating secondary schools believed to be non-Catholic, private schools (but not listed in the Handbook) were added to this number.

Table A-2

Estimated Number of 1959 Graduates Attending Public Secondary Schools Participating in the National Merit Program

State	No. of participating public secondary schools (1)	No. of 1959 graduates reported by principals[1] (2)	Estimated No. of 1959 graduates from participating but non-responding high schools[2] (3)	Estimated No. of 1959 graduates from participating schools (col. 2+3) (4)	Total No. of 1959 graduates from all public secondary schools[3] (5)	Percentage of 1959 graduates attending participating schools (6)
North Atlantic	2,371	325,483	7,229	332,712	356,112	93.4
Conn.	99	17,318	——	17,318	18,967	91.3
Dela.	26	2,614	64	2,678	2,971	90.1
Maine	123	6,079	267	6,346	7,440	85.3
Md.	112	18,112	195	18,307	20,134	90.9
Mass.	235	34,899	1,212	36,111	40,122	90.0
N. H.	72	4,174	100	4,274	4,338	98.5
N. J.	187	39,621	877	40,498	41,765	97.0
N. Y.	752	105,468	2,367	107,835	115,321	93.5
Pa.	658	86,380	1,615	87,995	92,954	94.7
R. I.	26	4,860	282	5,142	5,240	98.1
Vt.	70	2,637	250	2,887	3,365	85.8
D. C.	11	3,321	——	3,321	3,495	95.0
North Central	4,561	375,017	14,098	389,115	447,630	86.9
Ill.	558	66,617	1,843	68,460	73,339	93.3
Ind.	556	36,729	1,539	38,268	43,211	88.6
Iowa	479	22,662	1,203	23,865	28,589	83.5
Kansas	286	15,109	1,050	16,159	21,925	73.7
Mich.	503	61,815	1,277	63,092	64,898	97.2
Minn.	390	31,912	556	32,468	35,709	90.9

Table A-2 (Cont'd)

State	No. of schools (1)	Reported No. of 1959 graduates (2)	Estimated No. of 1959 graduates (3)	Col. 2+3 (4)	Total No. of 1959 graduates (5)	Percentage (6)
Mo.	796	24,737	1,344	26,081	34,349	75.9
Neb.	255	9,903	1,031	10,934	13,508	80.9
N. D.	133	4,315	404	4,719	7,006	67.4
Ohio	632	63,296	2,396	65,692	77,870	84.4
S. D.	114	4,551	211	4,762	7,201	66.1
Wisc.	359	33,371	1,244	34,615	40,025	86.5
Southeast	2,470	190,042	20,382	210,424	312,666	67.3
Ala.	169	14,109	1,690	15,799	29,342	53.8
Ark.	175	9,809	819	10,628	18,470	57.5
Fla.	183	26,024	1,404	27,428	32,655	84.0
Ga.	231	19,217	1,854	21,071	28,834	73.1
Ky.	162	11,598	816	12,414	22,508	55.2
La.	164	11,841	1,562	13,403	24,073	55.7
Miss.	129	6,487	912	7,399	18,232	40.6
N. C.	381	23,320	3,770	27,090	41,865	64.7
S. C.	241	14,069	2,029	16,098	19,554	82.3
Tenn.	226	18,562	3,016	21,578	29,920	72.1
Va.	231	18,273	2,067	20,340	27,167	74.9
W. Va.	178	16,733	443	17,176	20,046	85.7
West and Southwest	2,298	270,348	11,731	282,079	334,096	84.4
Arizona	66	8,754	13	8,767	9,391	93.4
Calif.	456	110,960	3,786	114,746	130,577	87.9
Colo.	179	12,725	555	13,280	14,481	91.7
Idaho	95	6,550	244	6,794	7,795	87.2
Mont.	120	5,804	222	6,026	6,707	89.8
Nev.	25	1,693	243	1,936	1,963	98.6

Table A-2 (Cont'd)

State	No. of schools (1)	Reported No. of 1959 graduates (2)	Estimated No. of #1959 graduates (3)	Col. 2+3 (4)	Total No. of 1959 graduates (5)	Percentage (6)
N. Mex.	63	5,968	30	5,998	7,821	76.7
Okla.	205	16,335	1,101	17,436	26,931	64.7
Ore.	168	15,494	575	16,069	17,771	90.4
Tex.	587	50,917	3,715	54,632	72,501	75.4
Utah	52	8,099	741	8,840	10,208	86.6
Wash.	229	24,048	465	24,513	24,599	99.7
Wyo.	53	3,001	41	3,042	3,351	90.8
Outlying Parts	42	6,145	52	6,197	6,233	99.4
Alaska	18	719	52	771	807	95.5
Hawaii	24	5,426	----	5,426	5,426#	100.0
Continental U.S.	11,700	1,160,890	53,440	1,214,330	1,450,504	83.7
Total-50 States plus D. C.	11,742	1,167,035	53,492	1,220,527	1,456,737	83.8

Footnotes for Table A-2

[1] Based upon reports from 10,473, or 89.2 per cent, of the 11,742 public secondary schools participating in the Spring, 1958 Merit Qualifying Test.

[2] Graduation frequencies for 1,194 participating (but non-responding) public secondary schools were estimated from the 1958 graduation frequencies in the Directory of Secondary Day Schools, U. S. Office of Education, 1961. Since there was a larger number of high school graduates in 1959 than in 1958, the use of these frequencies probably results in an underestimate of the number of 1959 graduates attending participating schools. Graduation frequencies could not be found for 75 schools, 18 of which are known to have closed before Fall, 1959.

[3] Estimated by assuming that in each state the ratio of 1959 graduates to the opening 11th grade enrollment in Fall, 1957 is equal to the ratio of 1958 graduates to the opening 11th grade enrollment in Fall, 1956. Since no biennial survey was made for the school year 1956-57 it was necessary to interpolate each state's 11th grade enrollment in Fall, 1956 from the 10th grade enrollment in Fall, 1955 and the 12th grade enrollment in Fall, 1957. Figures for the Continental U. S. were adjusted to total 1,450,500, the projected number of 1959 graduates from public secondary schools. Data for these estimates were obtained from: (a) Biennial Survey, Statistics of State School Systems; 1955-56, Chap. 2, Table 15, p.56, and (b) Prepublication tabulations provided by Mr. Samuel Schloss, U. S. Office of Education.

[4] To avoid absurd results for Vermont, it was assumed there was no attrition between the 10th grade enrollment in Fall, 1955 and the 11th grade enrollment in Fall, 1956. For Hawaii no estimate of 10th grade enrollments in Fall, 1955 was available, hence the 1959 graduation frequency reported by participating schools was used.

Table A-3

Estimated Number of 1959 Graduates Attending Catholic Secondary Schools Participating in the Merit Program

State	No. of participating Catholic secondary schools (1)	No. of 1959 graduates reported by participating schools[1] (2)	No. of 1959 graduates from Catholic secondary schools responding to NCWC Survey[2] (3)	Estimated No. of 1959 graduates from all Catholic secondary schools[3] (4)	Percentage of 1959 graduates from Catholic schools attending participating schools[4] (5)
North Atlantic	670	58,894	51,176	59,187	99.5
Connecticut	24	1,986	1,509	1,986	100.0
Delaware	5	479	434	479	100.0
Maine	16	551	559	559*	98.6
Maryland	33	1,947	1,929	1,947	100.0
Massachusetts	121	7,742	6,560	7,742	100.0
New Hampshire	16	773	874	874*	88.4
New Jersey	72	7,666	4,874	7,666	100.0
New York	193	18,160	17,712	18,160	100.0
Pennsylvania	155	17,044	14,206	17,044	100.0
Rhode Island	14	1,226	1,330	1,330*	92.2
Vermont	7	225	305	305*	73.8
D. C.	14	1,095	884	1,095	100.0
North Central	702	56,058	50,027	56,190	99.8
Illinois	112	13,924	12,637	13,924	100.0
Indiana	27	2,887	2,473	2,887	100.0
Iowa	94	2,853	2,354	2,853	100.0
Kansas	25	1,039	1,171	1,171*	88.7
Michigan	141	9,633	8,420	9,633	100.0
Minnesota	49	3,541	3,164	3,541	100.0
Missouri	58	4,617	3,843	4,617	100.0
Nebraska	35	1,356	1,331	1,356	100.0

Table A-3 (Cont'd)

State	No. of schools (1)	No. of 1959 graduates (2)	No. of 1959 graduates from NCWC (3)	Total (4)	Percentage (5)
North Dakota	11	433	314	433	100.0
Ohio	103	10,642	9,599	10,642	100.0
South Dakota	10	300	263	300	100.0
Wisconsin	37	4,833	4,458	4,833	100.0
Southeast	213	9,347	8,899	9,671	96.6
Alabama	11	500	686	686*	72.9
Arkansas	12	294	301	301*	97.7
Florida	22	681	664	681	100.0
Georgia	9	323	352	352*	91.8
Kentucky	44	2,408	2,371	2,408	100.0
Louisiana	51	3,034	2,512	3,034	100.0
Mississippi	16	355	369	369*	96.2
North Carolina	7	105	119	119*	88.2
South Carolina	4	128	91	128	100.0
Tennessee	12	612	460	612	100.0
Virginia	14	441	515	515*	85.6
West Virginia	11	466	459	466	100.0
West and Southwest	262	16,318	13,588	16,645	98.0
Arizona	9	634	318	634	100.0
California	107	8,870	6,927	8,870	100.0
Colorado	14	929	824	929	100.0
Idaho	4	80	91	91*	87.9
Montana	12	578	508	578	100.0
Nevada	1	55	114	114*	48.2
New Mexico	10	285	375	375*	76.0
Oklahoma	16	334	501	501*	66.7
Oregon	16	804	695	804	100.0
Texas	48	2,287	2,111	2,287	100.0

Table A-3 (Cont'd)

State	No. of schools (1)	No. of 1959 graduates (2)	No. of 1959 graduates from NCWC (3)	Total (4)	Percentage (5)
Utah	4	138	107	138	100.0
Washington	20	1,268	1,017	1,268	100.0
Wyoming	1	56	-----	56	100.0
Outlying Parts	5	474	-----	474	100.0
Alaska	----	-----	-----	-----	-----
Hawaii	5	474	-----	474	100.0
Continental U.S.	1,847	140,617	123,690	141,693	99.2
Total-50 states plus D.C.	1,852	141,091	123,690	142,167	99.2

[1] Based upon reports from 1,704, or 92.0 per cent, of the 1,852 Catholic secondary schools participating in the Spring, 1958 National Merit Scholarship Qualifying test.

[2] From Summary of Catholic Education, 1959, Washington, D.C.: National Catholic Welfare Conference, 1960. The data are based upon 80 per cent returns from a survey in Fall, 1959 of 2,390 Catholic secondary schools.

[3] For each state, the larger estimate of 1959 graduates shown in cols. 2 and 3 was used. For the 15 state frequencies with asterisks the number from the NCWC Survey was the larger; for the remaining 36 states the number from the survey reported here was the larger.

[4] These percentages are overestimates since the number of 1959 graduates from all Catholic secondary schools is probably higher than indicated by the frequencies in col. 4. For example, in the 36 states for which the col. 2 frequency was greater than the corresponding col. 3 frequency, only 93 per cent of the participating Catholic secondary schools provided reports on the number of their 1959 graduates.

Table A-4

Participation of 1959 Graduates in the 1958 National Merit Scholarship Qualifying Test, by State

State	Public high school graduates			Catholic high school graduates			Other, nonpublic high school graduates			All high school graduates		
	Estimated No. of graduates[1] (1)	No. of graduates taking test[2] (2)	Percentage taking test (3)	Estimated No. of graduates[3] (4)	No. of graduates taking test[2] (5)	Percentage taking test (6)	Estimated No. of graduates[4] (7)	No. of graduates taking test[2] (8)	Percentage taking test (9)	Estimated No. of graduates (10)	No. of graduates taking test (11)	Percentage taking test (12)
North Atlantic	356,112	98,611	27.7	59,187	33,871	57.2	21,178	9,818	46.4	436,477	142,300	32.6
Conn.	18,967	4,684	24.7	1,986	1,153	58.1	2,332	888	38.1	23,285	6,725	28.9
Dela.	2,971	811	27.3	479	392	81.8	257	120	46.7	3,707	1,323	35.7
Maine	7,440	1,777	23.9	559	343	61.4	1,321	416	31.5	9,320	2,536	27.2
Md.	20,134	4,744	23.6	1,947	1,272	65.3	1,184	491	41.5	23,265	6,507	28.0
Mass.	40,122	10,043	25.1	7,742	5,115	66.1	3,135	1,430	45.6	50,999	16,588	32.5
N. H.	4,338	1,321	30.5	874	427	48.9	816	418	51.2	6,028	2,166	35.9
N. J.	41,765	11,862	28.4	7,666	4,278	55.8	1,540	645	41.9	50,971	16,785	32.9
N. Y.	115,321	34,278	29.7	18,160	11,696	64.4	5,580	3,130	56.1	139,061	49,104	35.3
Penn.	92,954	25,837	27.8	17,044	7,516	44.1	3,557	1,457	41.0	113,555	34,810	30.7
R. I.	5,240	1,708	32.6	1,330	752	56.5	328	236	72.0	6,898	2,696	39.1
Vt.	3,365	940	27.9	305	144	47.2	682	308	45.2	4,352	1,392	32.0
D. C.	3,495	606	17.3	1,095	783	71.5	446	279	62.6	5,036	1,668	33.1
North Central	447,630	118,569	26.5	56,190	30,189	53.7	8,748	4,288	49.0	512,568	153,046	29.9
Ill.	73,339	21,956	29.9	13,924	8,036	57.7	1,868	958	51.3	89,131	30,950	34.7
Ind.	43,211	12,572	29.1	2,887	1,126	39.0	730	368	50.4	46,828	14,066	30.0
Iowa	28,589	7,365	25.8	2,853	1,418	49.7	181	86	47.5	31,623	8,869	28.0

Table A-4 (Cont'd)

State	Public			Catholic			Other, nonpublic			All		
	N (1)	Test-takers (2)	% (3)	N (4)	Test-takers (5)	% (6)	N (7)	Test-takers (8)	% (9)	N (10)	Test-takers (11)	% (12)
Kansas	21,925	5,489	25.0	1,171	670	57.2	346	117	33.8	23,442	6,276	26.8
Mich.	64,898	22,077	34.0	9,633	5,349	55.5	1,776	809	45.6	76,307	28,235	37.0
Minn.	35,709	7,553	21.1	3,541	1,818	51.3	500	273	54.6	39,750	9,644	24.3
Mo.	34,349	7,405	21.6	4,617	2,575	55.8	788	395	50.1	39,754	10,375	26.1
Neb.	13,508	3,960	29.3	1,356	694	51.2	139	92	66.2	15,003	4,746	31.6
N. D.	7,006	1,563	22.3	433	193	44.6	103	65	63.1	7,542	1,821	24.1
Ohio	77,870	17,734	22.8	10,642	5,505	51.7	1,008	476	47.2	89,520	23,715	26.5
S. D.	7,201	1,494	20.7	300	202	67.3	221	94	42.5	7,722	1,790	23.2
Wisc.	40,025	9,401	23.5	4,833	2,603	53.9	1,088	555	51.0	45,946	12,559	27.3
Southeast	312,666	56,832	18.2	9,671	5,581	57.7	7,356	3,578	48.6	329,693	65,991	20.0
Ala.	29,342	4,030	13.7	686	286	41.7	465	190	40.9	30,493	4,506	14.8
Ark.	18,470	2,617	14.2	301	180	59.8	60	3	5.0	18,831	2,800	14.9
Fla.	32,655	8,246	25.3	681	330	48.5	637	430	67.5	33,973	9,006	26.5
Ga.	28,834	5,921	20.5	352	261	74.1	787	485	61.6	29,973	6,667	22.2
Ky.	22,508	3,034	13.5	2,408	1,406	58.4	483	191	39.5	25,399	4,631	18.2
La.	24,073	2,695	11.2	3,034	1,879	61.9	373	259	69.4	27,480	4,833	17.6
Miss.	18,232	2,567	14.1	369	166	45.0	331	71	21.1	18,932	2,804	14.8
N. C.	41,865	7,988	19.1	119	70	58.8	447	173	39.7	42,431	8,231	19.4
S. C.	19,554	5,586	28.6	128	98	76.6	427	163	38.2	20,109	5,847	29.1
Tenn.	29,920	4,863	16.3	612	337	55.1	1,399	868	62.0	31,931	6,068	19.0
Va.	27,167	5,587	20.6	515	271	52.6	1,773	666	37.6	29,455	6,524	22.1
W. Va.	20,046	3,698	18.4	466	297	63.7	174	79	45.4	20,686	4,074	19.7
West and Southwest	334,096	75,515	22.6	16,645	9,648	58.0	4,501	1,917	42.6	355,242	87,080	24.5
Ariz.	9,391	2,173	23.1	634	305	48.1	235	92	39.1	10,260	2,570	25.0
Calif.	130,577	24,826	19.0	8,870	4,954	55.9	2,043	882	43.2	141,490	30,662	21.7
Colo.	14,481	4,209	29.1	929	674	72.6	233	106	45.5	15,643	4,989	31.9

Table A-4 (Cont'd)

State	Public N (1)	Test-takers (2)	% (3)	Catholic N (4)	Test-Takers (5)	% (6)	Other, nonpublic N (7)	Test-Takers (8)	% (9)	All N (10)	Test-Takers (11)	% (12)
Idaho	7,795	2,554	32.8	91	29	31.9	———	———	———	7,886	2,583	32.8
Mont.	6,707	2,011	30.0	578	334	57.8	———	———	———	7,285	2,345	32.2
Nev.	1,963	603	30.7	114	35	30.7	———	———	———	2,077	638	30.7
N. Mex.	7,821	1,674	21.4	375	154	41.1	365	72	19.7	8,561	1,900	22.2
Okla.	26,931	4,545	16.9	501	219	43.7	213	84	39.4	27,645	4,848	17.5
Ore.	17,771	4,869	27.4	804	503	62.6	78	43	55.1	18,653	5,415	29.0
Texas	72,501	16,030	22.1	2,287	1,345	58.8	923	418	45.3	75,711	17,793	23.5
Utah	10,208	2,534	24.8	138	111	80.4	121	70	57.9	10,467	2,715	25.9
Wash.	24,599	8,599	35.0	1,268	964	76.0	261	135	51.7	26,128	9,698	37.1
Wyo.	3,351	888	26.5	56	21	37.5	29	15	51.7	3,436	924	26.9
Outlying Parts	6,233	1,711	27.5	474	152	32.1	1,035	568	54.9	7,742	2,431	31.3
Alaska	807	351	43.5	———	———	———	20	4	20.0	827	355	42.9
Hawaii	5,426	1,360	25.1	474	152	32.1	1,015	564	55.6	6,915	2,076	30.0
Continental U.S.	1,450,504	349,527	24.1	141,693	79,289	56.0	41,783	19,601	46.9	1,633,980	448,417	27.4
Total-50 states plus D. C.	1,456,737	351,238	24.1	142,167	79,441	55.9	42,818	20,169	47.1	1,641,722	450,848	27.5

Footnotes for Table A-4

[1] From col. 5, Table A-2.

[2] Based upon survey of principals of participating high schools. Principals were asked to report the number of their 1959 graduates who had taken the 1958 NMSQT. The percentages of participating public, Catholic, and other private secondary schools responding to this question were 88, 90, and 91 respectively.

[3] From col. 4, Table A-3.

[4] Based upon a survey of 871 participating, private secondary schools, of which 806 (or 92.5 per cent) provided estimates of the number of their 1959 graduates. Since the responding schools represent only about 65-70 per cent of the estimated number of existing non-Catholic, private secondary schools, the total number of 1959 graduates is underestimated, and the proportion of private school graduates tested is overestimated.

Appendix B

POST-GRADUATION ACTIVITIES OF MERIT EXAMINEES

Tables B-1 to B-3 repeat information from the two figures in Chapter 3 and provide additional data on the numbers of examinees and percentages enrolling in non-college, training courses for sex, aptitude, and family financial resources subgroups.

Table B-1

Talent Loss by Sex and Aptitude Level

NMSQT selection score	Equivalent percentile rank relative to national norms	N	Percentage of respondents: Going to college full-time	Going to college part-time	enrolling in other kinds of training courses	discontinuing school	total percentage
			I. BOYS				
88 - 89	64 - 65	655	72.5	3.5	4.4	19.6	100.0
90 - 92	66 - 68	1,017	79.0	2.7	3.9	14.4	100.0
93 - 97	70 - 74	1,790	80.7	2.2	3.8	13.3	100.0
98 - 102	75 - 79	1,660	82.2	2.3	3.3	12.2	100.0
103 - 107	80 - 84	1,647	84.2	2.1	3.3	10.4	100.0
108 - 113	85 - 90	1,846	88.0	1.7	2.3	8.0	100.0
114 - 124	90 - 95	2,568	90.4	1.5	1.9	6.2	100.0
125 +	95 +	2,507	95.6	.7	.9	2.8	100.0
		13,690					
Totals (Boys)*		P	86.3	1.8	2.7	9.2	100.0
		P'	86.2	1.8	2.8	9.2	100.0
			II. GIRLS				
88 - 89	64 - 65	657	61.5	3.2	16.1	19.2	100.0
90 - 92	66 - 68	1,038	64.9	1.9	16.0	17.2	100.0
93 - 97	70 - 74	1,861	67.6	2.8	12.6	17.0	100.0
98 - 102	75 - 79	1,824	73.2	2.0	10.8	14.0	100.0
103 - 107	80 - 84	1,758	74.7	2.3	9.3	13.7	100.0
108 - 113	85 - 90	1,806	78.6	2.5	9.1	9.8	100.0
114 - 124	90 - 95	2,386	81.1	1.5	8.3	9.1	100.0
125 +	95 +	1,751	92.3	.7	3.2	3.8	100.0
		13,081					
Totals (Girls)*		P	76.1	2.0	9.9	12.0	100.0
		P'	75.6	2.1	10.4	11.9	100.0

* See footnote to Table 11 in Chapter 3.

Table B-2

Talent Loss Among Men as a Function of Aptitude Level and Family Financial Resources

			Percentage of respondents				
NMSQT selection score	Equivalent percentile rank relative to national norms	N	going to college full-time	going to college part-time	enrolling in other kinds of training courses	discontinuing school	Totals
	I Family Resources of $300 or Less Per Year*						
88 - 102	64 - 79	1,687	67.0	4.9	4.9	23.2	100.0
103 - 107	80 - 84	504	72.0	3.4	5.8	18.8	100.0
108 - 113	85 - 90	552	77.2	2.5	4.7	15.6	100.0
114 - 124	90 - 95	680	80.1	2.8	3.7	13.4	100.0
125 +	95 +	516	90.1	1.5	1.0	7.4	100.0
Sub-totals		3,939	74.4	3.5	4.3	17.8	100.0
	II Family Resources of $400 - $700 Per Year*						
88 - 102	64 - 79	1,289	82.8	2.1	3.6	11.5	100.0
103 - 107	80 - 84	385	84.7	2.6	3.1	9.6	100.0
108 - 113	85 - 90	453	89.8	1.8	2.0	6.4	100.0
114 - 124	90 - 95	644	92.1	1.4	1.9	4.6	100.0
125 +	95 +	559	96.4	.5	1.1	2.0	100.0
Sub-totals		3,330	88.0	1.7	2.6	7.7	100.0
	III Family Resources of $800 or More Per Year						
88 - 102	64 - 79	1,814	90.8	.7	2.3	6.2	100.0
103 - 107	80 - 84	660	93.2	.9	2.0	3.9	100.0
108 - 113	85 - 90	732	95.4	1.0	.5	3.1	100.0
114 - 124	90 - 95	1,102	96.6	.8	.6	2.0	100.0
125 +	95 +	1,293	97.9	.5	.3	1.3	100.0
Sub-totals		5,601	94.4	.7	1.3	3.6	100.0
	IV Indeterminate Family Resources						
88 - 102	64 - 79	332	73.5	1.8	5.7	19.0	100.0
103 - 107	80 - 84	98	84.7	1.0	---	14.3	100.0
108 - 113	85 - 90	109	87.2	1.8	2.7	8.3	100.0
114 - 124	90 - 95	142	84.5	.7	4.2	10.6	100.0
125 +	95 +	139	92.0	---	5.8	2.2	100.0
Sub-totals		820	81.7	1.2	4.4	12.7	100.0
Grand total		13,690					

* Classification by Ss by family resources was made on the basis of responses to the question, "Estimate the amount of money your family could contribute each year to finance your college costs if you decided to go to college." The last section (IV) of the table includes Ss not answering the question.

Table B-3

Talent Loss Among Women as a Function of Aptitude Level and Family Financial Resources

NMSQT selection score	Equivalent percentile rank relative to national norms	N	Percentage of respondents: going to college full-time	going to college part-time	enrolling in other kinds of training courses	discontinuing school	Totals
			I Family Resources of $300 or Less Per Year				
88 - 102	64 - 79	1,841	46.4	4.8	18.2	30.6	100.0
103 - 107	80 - 84	554	54.7	4.7	13.2	27.4	100.0
108 - 113	85 - 90	539	60.9	4.8	13.7	20.6	100.0
114 - 124	90 - 95	661	62.8	3.0	13.5	20.7	100.0
125 +	95 +	385	80.0	1.8	8.1	10.1	100.0
Sub-totals		3,980	55.5	4.2	15.1	25.2	100.0
			II Family Resources of $400 - $700 Per Year				
88 - 102	64 - 79	1,177	72.2	1.9	14.2	11.7	100.0
103 - 107	80 - 84	392	76.8	2.5	10.5	10.2	100.0
108 - 113	85 - 90	400	80.0	2.2	10.5	7.3	100.0
114 - 124	90 - 95	541	83.4	1.1	9.2	6.3	100.0
125 +	95 +	341	93.3	.3	3.2	3.2	100.0
Sub-totals		2,851	78.6	1.7	10.9	8.8	100.0
			III Family Resources of $800 or More Per Year				
88 - 102	64 - 79	1,985	87.5	.8	7.0	4.7	100.0
103 - 107	80 - 84	682	90.5	.3	4.8	4.4	100.0
108 - 113	85 - 90	754	90.3	.8	5.4	3.5	100.0
114 - 124	90 - 95	1,060	92.0	.7	4.3	3.0	100.0
125 +	95 +	922	97.0	.3	1.2	1.5	100.0
Sub-totals		5,403	90.8	.6	5.0	3.6	100.0
			IV Indeterminate Family Resources				
88 - 102	64 - 79	377	61.2	1.3	16.8	20.7	100.0
103 - 107	80 - 84	130	70.7	1.6	12.3	15.4	100.0
108 - 113	85 - 90	113	79.8	3.5	7.9	8.8	100.0
114 - 124	90 - 95	124	76.4	2.4	11.4	9.8	100.0
125 +	95 +	103	94.2	1.0	2.9	1.9	100.0
Sub-totals		847	71.4	1.8	12.4	14.4	100.0
Grand Total		13,081					

Appendix C

APPLICATIONS FOR COLLEGE LOANS

Tables C-1 and C-2 provide data on the number and percentage of Merit examinees not enrolling in college who made applications for college loans and who expressed willingness to apply for a federal loan.

Table C-1

Frequency of Application for College Loans
(reported by students not enrolling in college immediately)

Aptitude Level	Percentage saying "Yes" to "Have you applied for a loan at any college to help pay college costs?"									
	Estimated amount family could contribute for college per year								All respondents to question	
	$300 or less		$400 - $700		$800 or More		Indeterminate			
	N	%	N	%	N	%	N	%	N	%
I - Men										
64-79	469	3	192	3	154	1	51	4	866	3
80-84	123	4	48	0	39	3	12	8	222	3
85-90	108	1	38	0	26	4	5	0	177	1
90-95	113	3	42	0	28	0	14	0	197	2
95+	43	9	17	0	21	5	6	0	87	6
Sub-totals	856	3	337	1	268	2	88	3	1549	3
II - Women										
64-79	868	4	296	2	226	1	114	1	1504	3
80-84	215	2	77	4	60	2	31	0	383	2
85-90	173	5	69	3	64	2	13	0	319	3
90-95	221	7	82	4	75	4	19	0	397	5
95+	67	10	22	5	23	4	3	0	115	7
Sub-totals	1544	5	546	3	448	2	180	.5	2718	4
Men and Women	2400	4	883	2	716	2	268	1	4267	3

Table C-2

Attitudes toward Applying for a Federal Loan to Finance College (reported by students not enrolling in college immediately)

Aptitude Level	Percentage saying "Yes" to If you needed help to pay college costs, would you apply for a federal loan?"									
	Estimated amount family could contribute for college per year								All respondents to question	
	$300 or less		$400 - $700		$800 or More		Indeterminate			
	N	%	N	%	N	%	N	%	N	%
	I - Men									
64-79	448	53	188	51	149	52	44	41	829	52
80-84	120	65	49	65	39	54	9	56	217	63
85-90	109	50	37	54	27	48	3	33	176	51
90-95	110	55	40	53	27	52	11	45	188	54
95+	41	66	17	53	19	47	6	50	83	58
Sub-totals	828	55	331	54	261	52	73	44	1493	54
	II - Women									
64-79	832	44	279	52	220	55	92	35	1423	47
80-84	208	50	74	53	61	46	25	32	368	51
85-90	171	54	65	58	62	44	11	82	309	54
90-95	211	54	82	45	73	53	15	47	381	51
95+	66	61	19	74	25	60	3	33	113	62
Sub-totals	1488	48	519	53	441	52	146	39	2594	49
Men and Women	2316	51	850	53	702	52	219	41	4087	51

Appendix D

APTITUDE TEST SCORES OF STUDENTS BY PROBABLE FIELD OF STUDY AND COLLEGE OF INITIAL REGISTRATION

Table D-1 shows the percentile equivalents for NMSQT scores relative to the examinees planning to select given major fields of study at the beginning of college; these data are discussed in Chapter 9.

Table D-2 repeats information given in Figure 20 of Chapter 10, and provides additional data on the percentages of examinees at given aptitude levels enrolling in four-year institutions. Tables D-3 and D-4 summarize the median NMSQT scores of examinees enrolling at the 140 colleges and universities with the largest enrollments among respondents to the initial survey. In interpreting these average test scores the reader is cautioned that they may be misleading because of the relatively small percentages of each college's total first-time enrollment represented by respondents.

Table D-1

Aptitude Test Score Distributions of High-Ability Examinees, by Probable Major Field of Study

Probable major field of study*	No. of examinees	Percentiles in distributions of NMSQT scores				
		P_{10}	P_{25}	P_{50}	P_{75}	P_{90}
Specific fields						
Physics	588	100	111	123	136	144
Mathematics	1,191	95	103	114	127	138
Chemistry	1,050	94	102	114	127	138
Pol. Sci. & Gov't.	278	95	102	113	125	137
English	1,015	93	102	113	124	134
Mod. for. lang.	543	93	100	112	123	135
Pre-medical	1,089	93	101	111	123	134
Engineering	3,437	93	100	110	121	132
History	552	93	99	110	123	133
Psychology	487	93	100	109	122	133
Biological Sciences	862	92	98	109	120	130
Pre-law	510	91	98	108	118	128
Architecture	214	92	97	106	116	125
Fine and applied arts	433	92	98	106	117	127
Economics	440	92	98	106	117	129
Sociology	263	92	98	106	117	127
Health professions	706	92	97	106	116	124
Music	420	92	98	105	116	127
Journ. & Advertising	279	93	98	105	119	128
Religion	192	92	97	105	118	126
Speech	150	91	98	105	114	126
Pre-dental	217	92	96	104	114	122
Home economics	433	91	95	104	115	124
Elem. or second. educ.	2,705	91	96	104	113	122
Business & Commerce	1,189	90	94	102	111	120
Agriculture	104	90	94	101	109	114
Physical Education	189	90	94	100	109	118
Broadly defined fields						
Physical Sciences, Engineering, & Mathematics	6,369		101	113	125	
Languages	600		100	112	124	
English and Journalism	1,294		101	111	123	
Biological Sciences & Health professions	2,938		99	108	119	

Table D-1 (Cont'd)

Probable major field of study	No. of examinees	P_{10}	P_{25}	P_{50}	P_{75}	P_{90}
Social Sciences & Psychology	2,107		99	108	121	
Arts	1,003		97	105	116	
Education	2,905		96	103	113	
Business & Commerce	1,189		94	102	111	

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*Fields are listed in order of the median score for each distribution. Only fields chosen by at least 100 students are listed.

Table D-2

Type of College Enrollments of 21,718 Merit Examinees Classified by Sex, Aptitude Level and Scholarship Award Status

Equivalent percentile rank relative to national norms	Total N	Per cent holding Freshman scholarships	Students holding Freshman scholarships: N	Per cent enrolling in 4-year institutions	Per cent enrolling in privately controlled institutions	Students not holding Freshman scholarships: N	Per cent enrolling in 4-year institutions	Per cent enrolling in privately controlled institutions
I. Men								
64 - 65	474	15.8	75	93.3	38.7	399	82.2	37.1
66 - 68	797	14.1	112	92.0	42.9	685	84.2	33.7
70 - 74	1,440	19.2	276	88.8	44.6	1,164	87.8	34.9
75 - 79	1,360	19.6	266	92.9	41.7	1,094	89.8	40.5
80 - 84	1,384	21.9	303	94.4	42.2	1,081	90.3	40.4
85 - 90	2,621	28.8	467	94.4	43.0	1,154	89.9	41.0
90 - 95	2,317	33.2	769	93.2	51.2	1,548	92.6	43.1
95 +	2,389	52.3	1,250	97.8	63.6	1,139	94.3	54.3
Total(men)	11,782	29.9	3,518	94.7	52.0	8,264	89.9	41.4
II. Women								
64 - 65	401	22.9	92	77.2	42.4	309	84.1	41.1
66 - 68	672	23.8	160	87.5	40.0	512	84.8	37.5
70 - 74	1,258	25.5	321	89.7	44.2	937	88.3	37.0
75 - 79	1,333	26.4	352	91.2	42.9	981	89.1	41.0
80 - 84	1,310	29.4	385	86.2	41.8	925	90.6	40.5
85 - 90	1,416	34.9	494	91.7	43.1	922	90.[illegible]	43.2
90 - 95	1,932	41.6	803	94.9	51.3	1,129	93.7	45.0
95 +	1,614	52.4	845	96.6	61.2	769	95.1	53.7
Total (women)	9,936	34.7	3,452	92.2	49.2	6,484	90.3	42.6
Total(men and women)	21,718	32.1	6,970	93.5	50.6	14,748	90.1	41.9

Table D-3

Privately Controlled Colleges and Universities Ranked by Median Aptitude Test Scores of Merit Examinees Enrolled in Fall, 1959

College or University	No. of merit examinees enrolling in Fall, 1959	Total first-time degree credit enrollment Fall, 1959	Per cent of total first-time enrollment represented by merit examinees	Median NMSQT score of merit examinees enrolling
Mass. Inst. of Tech.	73	941	8	139.5
Harvard Univ.	62	1235	5	138.6
Rice Institute	48	420	11	134.9
Princeton Univ.	60	800	8	134.8
Wellesley College	40	479	8	133.0
Oberlin College	36	591	6	130.9
Brown Univ.	45	849	5	129.8
Stanford Univ.	126	1353	9	128.9
Smith College	47	583	8	128.0
Univ. of Chicago	52	544	10	127.8
Cornell Univ.	126	2152	6	127.5
Univ. of Rochester	49	1516	3	127.3
Yale Univ.	70	1030	7	126.7
Loyola Univ.	44	290	15	125.4
Columbia Univ.	72	1320	6	125.2
Carleton College	38	388	10	125.0
Northwestern Univ.	98	2132	5	124.3
Dartmouth College	52	844	6	124.1
Rensselear Poly. Tech.	42	850	5	122.5
Univ. of Penn.	72	4383	2	118.3
Vanderbilt Univ.	68	795	7	118.3
Tufts Univ.	37	764	5	118.1
Duke Univ.	103	1186	9	117.9
Lehigh Univ.	36	719	5	117.8
Carnegie Inst. Tech.	39	1119	4	116.7
Georgetown Univ.	42	1043	4	116.5
Depauw Univ.	51	684	8	116.0
Tulane Univ.	87	1282	7	115.8
Washington Univ.-Mo.	40	958	4	115.5
Univ. of Notre Dame	95	1615	6	114.2
Davidson College	35	258	14	112.5
Ohio Wesleyan	39	638	6	111.9
Univ. of Pittsburgh	60	1323	5	111.7
Villanova Univ.	52	1518	3	111.4
Emory Univ.	78	898	9	111.3

Table D-3 (Cont'd)

College or University	No. of merit examinees enrolling in Fall, 1959	Total first-time degree credit enrollment Fall, 1959	Per cent of total first-time enrollment represented by merit examinees	Median NMSQT score of merit examinees enrolling
St. Louis Univ.	46	1429	3	110.1
Gettysburg College	37	497	7	109.7
Valparaiso Univ.	45	1003	5	109.2
So. Methodist Univ.	51	1154	4	109.0
Brigham Young Univ.	89	2839	3	108.7
Drexel Inst. Tech.	36	936	4	108.5
Syracuse Univ.	69	1836	4	108.3
Univ. of Dayton	41	1816	2	108.1
Loyola Univ. -La.	35	710	5	108.0
Univ. of Southern Calif.	42	1080	4	107.7
Marquette Univ.	81	1408	6	107.2
Northeastern Univ.	53	5816	1	106.9
Baylor Univ.	61	1258	5	106.9
New York Univ.	49	2376	2	106.8
Univ. of Buffalo	44	2188	2	106.8
Temple Univ.	49	2433	2	106.6
Univ. of Tulsa	38	910	4	106.3
Boston Univ.	64	4201	2	106.2
Boston College	58	1706	3	106.0
Univ. of Detroit	66	2085	3	102.7
Wake Forest College	43	490	9	102.6
Univ. of Miami	40	3239	1	102.5

Table D-4

Publicly Controlled Colleges and Universities Ranked by Median Aptitude Test Score of Merit Examinees Enrolled in Fall, 1959

College or University	No. of merit examinees enrolling in Fall, 1959	Total first-time degree credit enrollment Fall, 1959	Per cent of total first-time enrollment represented by merit examinees	Median NMSQT score of merit examinees enrolling
U.S. Naval Academy	39	781	5	126.9
Univ. of Michigan	207	3216	6	117.2
State Univ. of Iowa	105	1813	6	116.7
Univ. of California	434	6300	7	115.0
Queens College	51	2811	2	113.6
Iowa State Teachers College	36	789	5	113.2
Washington State Univ.	78	1790	4	112.3
Univ. of Massachusetts	79	1966	4	112.3
Purdue Univ.	179	4444	4	112.2
Univ. of Colorado	108	2420	5	112.1
Georgia Institute of Technology	122	1339	9	112.1
Rutgers Univ.	106	3215	3	112.0
Oregon State	69	1848	4	111.7
Univ. of Minnesota	171	5389	3	111.7
Univ. of Maine	50	1115	5	111.5
Iowa State Univ.	82	1984	4	111.4
City College of New York	83	5952	1	111.3
Kansas State Univ.	62	2031	3	111.2
Univ. of Texas	213	2879	7	111.2
Univ. of Kansas	90	1531	6	111.0

Table D-4 (Cont'd)

College or University	No. of merit examinees enrolling in Fall, 1959	Total first-time degree credit enrollment Fall, 1959	Per cent of total first-time enrollment represented by merit examinees	Median NMSQT score of merit examinees enrolling
Univ. of Arizona	51	2915	2	111.0
Brooklyn College	74	2352	3	110.8
Univ. of New Mexico	38	1290	3	110.8
Univ. of Washington	101	3294	3	110.6
Univ. of Cincinnati	85	3532	2	110.3
Univ. of Missouri	83	2985	3	110.2
Univ. of Illinois	221	6527	3	109.8
Univ. of Wisconsin	268	6261	4	109.8
Ohio State Univ.	141	4302	3	108.6
Univ. of Connecticut	67	2302	3	108.6
Ohio Univ.	98	3394	3	108.5
Texas Technological College	70	1933	4	108.5
Univ. of Utah	84	1991	4	108.1
Univ. of Nebraska	78	1731	5	108.1
Univ. of Oregon	69	1915	4	108.1
Virginia Poly. Inst.	82	1433	6	107.8
Univ. of Mississippi	62	1046	6	107.6
San Diego State College	66	1900	4	107.5
Univ. of Oklahoma	113	2140	5	107.5
Florida State Univ.	83	2904	3	106.9
Wayne State Univ.	77	1696	5	106.8
Univ. of Delaware	36	880	4	106.8
Miami Univ.	111	2406	5	106.6
Northern Illinois Univ.	44	1664	3	106.6
Univ. of Arkansas	66	1097	6	106.5
Memphis State Univ.	52	1210	4	106.4
Univ. of Tennessee	89	3591	3	106.4
Univ. of Rhode Island	37	1667	2	106.3
Univ. of Florida	128	2818	5	106.3
Univ. of Maryland	94	3128	3	106.2
Pennsylvania State Univ.	205	4487	5	106.1
Hunter College	57	1599	4	105.8
Univ. of North Carolina	132	1552	9	105.6

Table D-4 (Cont'd)

College or University	No. of merit examinees enrolling in Fall, 1959	Total first-time degree credit enrollment Fall, 1959	Per cent of total first-time enrollment represented by merit examinees	Median NMSQT score of merit examinees enrolling
Oklahoma State Univ.	84	2373	4	105.4
Univ. of Hawaii	64	1094	6	105.4
West Virginia Univ.	89	1448	6	105.2
Mississippi State Univ.	52	742	7	105.0
Indiana Univ.	126	5765	2	104.9
Univ. of North Carolina (C. of A & E)	94	1693	6	104.8
San Jose State College	102	2127	5	104.5
Univ. of Louisville	48	1031	5	104.5
Michigan State Univ.	173	4300	4	104.4
Univ. of North Carolina (Woman's College)	90	1053	9	104.4
Univ. of South Carolina	68	1285	5	104.3
Louisiana State Univ.	140	3302	4	104.3
State Univ. of New York	200	7578	3	103.9
Univ. of Alabama	109	2846	4	103.6
Alabama Poly. Inst.	99	1447	7	103.5
Mississippi State College for Women	41	532	8	103.3
Univ. of Georgia	55	1420	4	103.1
Clemson Agric. Col.	52	1020	5	102.9
Kent State Univ.	54	2915	2	102.7
Texas A & M (College Station)	63	1764	4	102.6
Bowling Green State Univ.	47	2009	2	102.2
Colorado State Univ.	40	1803	2	102.1
Southern Illinois Univ.	45	3039	2	101.9
College of William and Mary	82	1912	4	101.5

Table D-4 (Cont'd)

College or University	No. of merit examinees enrolling in Fall, 1959	Total first-time degree credit enrollment Fall, 1959	Per cent of total first-time enrollment represented by merit examinees	Median NMSQT score of merit examinees enrolling
Univ. of Kentucky	76	1871	4	101.5
Ball State Teachers College	48	1684	3	101.5
North Texas State College	40	1743	2	100.8
Western Michigan Univ.	51	1580	3	100.5
Central Michigan Univ.	39	1276	3	100.0
Marshall College	50	1135	4	98.8

Appendix E

SCALES FOR ASSESSING FACULTY AND STUDENT PRESS

Table E-1 shows items in each of the 14 scales included in the Inventory of College Characteristics described in Chapter 11, and provides additional information about the scale reliabilities, item marginals, and item total-scale-score correlations. Item numbers indicate the position of each item in the printed Inventory, which is shown together with the instructions given to students in Appendix G. The results of a factor analysis of the intercorrelations (shown in Table E-2) between average press scores for the 140 colleges indicate that five factors are represented. These factors have been tentatively identified as follows: (a) Humanistic Press (high scores on Scales 3,4,7,8,11,12, and 14, and low scores on scales 5 and 9); (b) Warmth of Human Relations (high scores on scales 1 and 6); (c) Social Conformity (high scores on scale 13); (d) Absence of Competition (low scores on scale 10); and (e) Directiveness (high scores on scale 2). Scale scores were calculated by counting plus one for each response in the keyed direction (cf. T or F shown in parentheses after each statement). Thus on each scale, scores could range from 0 to 10.

Tables E-3 and E-4 show the results of covariance analyses described in Chapter 13 for testing the hypothesis that college press influences degree aspirations.

Table E-1

Items in the Inventory of College Characteristics

Scale 1: Faculty press for Affiliation

Item statistics‡

Scale reliability: .85

		%	r
1.	Professors frequently go out of their way to establish friendly relations with the students. (T)	[illegible]	.77
15.	Faculty members are available to students only during scheduled office hours. (F)	46%	.75
21.	An open display of emotion would embarrass most professors. (F)	60%	.50
35.	The professors seem to have little time for conversation with the students. (F)	68%	.82
41.	The faculty here takes a personal interest in students and their work. (T)	50%	.91
55.	The professors really talk *with* the students, not just at them. (T)	57%	.87
61.	Instructors seem personally interested in their students. (T)	50%	.91
75.	As a general rule students here almost never get to know their teachers well enough to count them as personal friends. (F)	29%	.84
81.	Instructors are typically friendly and sympathetic in manner. (T)	74%	.77
95.	The faculty keeps pretty much to itself and rarely fraternizes with students. (F)	47%	.91

Scale 2: Faculty press for Directiveness

Scale reliability: .60

		%	r
3.	Instructors seldom outline the day's lecture or discussion at the beginning of the class period. (F)	46%	.60
17.	It is hard to prepare for examinations because students seldom know what will be expected of them. (F)	79%	.57
23.	It is easy to take clear and systematic notes in courses here. (T)	70%	.66
37.	In most courses students do not know what the topic of the next lecture will be because the lecturer rarely announces it. (F)	77%	.65
43.	Instructors clearly explain the goals and purposes of their courses. (T)	66%	.64
57.	Teachers usually distribute, or have students buy, a course syllabus which summarizes the material to be covered during the term. (T)	50%	.60

		%	r
63.	Most courses are meticulously organized and progress systematically from topic to topic. (T)	65%	.63
77.	The faculty tries hard to avoid giving lectures in class so that students can participate extensively in class discussion. (F)	84%	.15
83.	Assignments are usually clear and specific, making it easy for students to plan their studies effectively. (T)	80%	.72
97.	Teachers here rarely attempt to summarize the day's lecture at the end of the period. (F)	34%	.65

Scale 3: Faculty press for Enthusiasm

Scale reliability: .83

		%	r
5.	The campus atmosphere does not seem to be very stimulating for faculty members. (F)	72%	.61
19.	Lectures are frequently routine and duplicate material in the text. (F)	44%	.57
25.	Many of the instructors seem bored with their teaching assignments. (F)	74%	.80
39.	Faculty members put a lot of energy and enthusiasm into their teaching. (T)	66%	.88
45.	Instructors really get students interested in their subjects (T)	44%	.80
59.	The outstanding traits of the faculty are their dedication to, and enthusiasm for, their work. (T)	60%	.89
65.	Professors typically exhibit great interest and enthusiasm in their subjects. (T)	66%	.85
79.	Many of the professors here seem discouraged about the job rewards associated with college teaching. (F)	71%	.71
85.	Many lectures are delivered in a monotone with little inflection or emphasis. (F)	61%	.79
99.	It is obvious that the teachers here have fallen in love with the search for knowledge. (T)	45%	.74

Scale 4: Faculty press for Achievement

Scale reliability: .69

		%	r
7.	The faculty is outstanding for the emphasis it places on student scholarship and research. (T)	50%	.75

% r

27. The faculty shows very little interest in the methods and philosophy of science. (F) 83% .56

47. Professors frequently encourage qualified students to do graduate work. (T) 84% .66

67. Personality, pull, and bluff get students through many courses(F) 65% .65

87. The student can pass most courses just by learning what's in the textbook. (F) 34% .69

101. There aren't very many courses here which demand excellent performance by all students. (F) 52% .71

109. The professors are really skillful at getting students to work to the limit of their capacities. (T) 27% .78

117. Teachers here expect, and usually get, excellence in the academic performance of students. (T) 41% .76

125. Instructors typically avoid presenting more material than the student can handle. (F) 67% .43

133. The faculty frequently encourages students to enroll in the Honors Program or in similar advanced courses of study. (T) 70% .63

Scale 5: Faculty press for Compliance

Scale reliability: .57

9. Term papers and course projects often rate an A even though they do not fulfill the letter of the instructors assignment.(F) 84% .52

29. The faculty often permits students to deviate somewhat from published curriculum requirements in their course work. (F) 48% .67

49. Instructors are relatively permissive when it comes to enforcing rules regarding course prerequisites. (F) 57% .65

69. Instructors go out of their way to be tolerant of students who do not comply with course requirements. (F) 84% .54

89. Frequent tests are given in most courses. (T) 59% .63

103. Teachers usually mark down students who complete assignments late. (T) 89% .51

111. Students absent from class must present excuses when they return. (T) 26% .52

		%	r
119.	Instructors often waive requirements for admission to their courses. (F)	75%	.70
127.	Faculty advisors are very reluctant to approve any exceptions in the curriculum requirements for graduation. (T)	76%	.66
135.	The faculty usually demands strict compliance with all course requirements. (T)	84%	.72

Scale 6: Faculty press for Supportiveness

Scale reliability: .69

		%	r
11.	Instructors often discuss the student's goals with them and try to help them discover their special talents. (T)	38%	.66
31.	The faculty often trys to show qualified students how they can become creative or productive workers in their field of study. (T)	70%	.65
51.	Students having difficulty with their courses can easily get special tutoring or counsel from the department's instructors. (T)	66%	.69
71.	Teachers are sensitive to student complaints and grievances and frequently try to remedy the situation. (T)	59%	.77
91.	Professors rarely try to spare the student's feelings when giving negative evaluations. (F)	49%	.50
105.	Instructors here are sometimes sarcastic in class. (F)	23%	.49
113.	Counseling and guidance services are really personal, patient, extensive. (T)	55%	.69
121.	Instructors are sometimes careless about acquainting students with curriculum requirements. (F)	60%	.66
129.	The faculty expects the undergraduate to get by almost completely on his own resources. (F)	35%	.67
137.	Faculty advisors usually restrict appointments for planning study programs to one or two periods during the year. (F)	53%	.67

Scale 7: Faculty press for Humanism

Scale reliability: .76

		%	r
13.	Very few of the professors here try to get students interested in the humanities. (F)	70%	.77
33.	Student interest in understanding and criticizing important works in art, music, and drama is encouraged by the faculty. (T)	65%	.76

		%	r
53.	Faculty advisors seem unaware that a well-rounded program of study includes courses in the arts and humanities. (F)	84%	.54
73.	Instructors here have very little interest in drama or the arts. (F)	80%	.72
93.	Instructors here continually go out of their way to try to liberate the student from his prejudices and provincialisms. (T)	48%	.69
107.	The faculty frequently encourages the student to take courses in the humanities. (T)	72%	.81
115.	Professors here show no interest in tracing the sources of their specialized field of study to philosophical or humanistic movements in the history of ideas. (F)	65%	.80
123.	The faculty discourages students from specializing in their major field during the first two years. (T)	56%	.43
131.	Professors who are true scholars in the humanities would feel out of place among faculty members here. (F)	84%	.70
139.	All students here are expected to take numerous elective courses in English, literature, History, or Philosophy. (T)	56%	.83

Scale 8: Faculty press for Independence

Scale reliability: .70

14.	There are many facilities and opportunities for individual creative activity. (T)	68%	.58
34.	The faculty is usually too busy to invent ways of encouraging initiative among students. (F)	54%	.74
54.	There is little opportunity here for pursuing independent study under the supervision of faculty members. (F)	60%	.69
74.	The college rarely encourages students to undertake independent projects or theses. (F)	58%	.83
94.	In class discussions, papers, and exams the main emphasis is on the development of critical judgment. (T)	64%	.62
108.	A well-reasoned report can rate an A grade here even though its viewpoint is opposed to the professors. (T)	85%	.60
116.	The faculty tends to be critical of unconventional and novel ideas in papers and reports. (F)	78%	.50
124.	The faculty often feels free to go into absolutely anything in trying to encourage students to develop their interests. (T)	48%	.67

		%	r
132.	Professors here conscientiously attempt to cover the sourse syllabus and do not encourage departures from the planned course of study. (F)	39%	.52
140.	Many instructors "play it by ear" adjusting assignments and projects to the individual student's interests. (T)	22%	.70

Scale 9: Faculty press for Vocationalism

Scale reliability: .76

		%	r
12.	Professors seem to think that the chief purpose of a college education is to provide technical training. (T)	19%	.36
32.	The academic atmosphere is practical, emphasizing efficiency and usefulness. (T)	60%	.71
52.	The college offers many really practical courses designed to prepare the student for his occupation. (T)	77%	.82
72.	Very few of the courses here will be useful to students who go into business or industry. (F)	86%	.68
92.	Education here tends to make students more practical and realistic. (T)	71%	.81
106.	Very few instructors try to give the student the practical training he will need in his career field. (F)	72%	.78
114.	Very few of the courses here aim at preparing the student for his vocation. (F)	84%	.70
122.	The academic atmosphere is not very helpful to the student who wants to specialize in business, engineering management or other practical affairs. (F)	80%	.68
130.	Most instructors are very practical and pragmatic in their approach to college training. (T)	68%	.74
138.	Most professors here refute the idea that the main purpose of college education is to prepare the student for his vocation. (F)	56%	.67

Scale 10: Student press for Competition

Scale reliability: .80

		%	r
10.	There is a great deal of rivalry for grades among students. (T).	61%	.82

		%	r
30.	The competition for high achievement is intense. (T)	58%	.90
50.	The high calibre of students here puts a lot of pressure on one. (T)	52%	.80
70.	Most students here are quite aware of the competition to get into graduate school. (T)	69%	.72
90.	Many students here are content just to get by. (F)	35%	.67
104.	The competition for special honors in very rough. (T)	79%	.73
112.	There are relatively few really capable students here. (F)	92%	.49
120.	Students here attach little importance to how well they do relative to others in their class. (F)	79%	.73
128.	Good grades are of little concern to most students here. (F)	86%	.67
136.	Very few students here feel they are in competition with each other. (F)	69%	.84

Scale 11: Student press for Estheticism

Scale reliability: .80

		%	r
8.	Students here tend to avoid courses which deal with broad human values or life goals. (F)	74%	.70
28.	Student rooms are more likely to be decorated with pennants and pin-ups than with paintings, carvings, mobiles, fabrics, etc. (F)	44%	.65
48.	When students get together they often talk about trends in art, music or the theater. (T)	25%	.71
68.	Humanities courses are often elected by students majoring in other areas. (T)	71%	.62
88.	There is a lot of interest here in student theatrical groups. (T)	53%	.67
102.	There is a lot of interest here in poetry, music, painting, sculpture, architecture, etc. (T)	42%	.89
110.	Concerts and art exhibits always draw big crowds of students (T)	41%	.77
118.	A student who insists on analyzing and classifying art and music is likely to be regarded as a little odd. (F)	59%	.79

% r

126. Most students here prefer to take only courses closely related to their specialized fields of study. (F) 47% .64

134. A lecture by an outstanding poet or dramatist would draw very few students here. (F) 63% .79

Scale 12: Student press for Reflectiveness

Scale reliability: .75

6. The student newspaper rarely carries articles intended to stimulate discussion of philosophical or ethical matters. (F) 71% .52

20. There is very little student interest in the philosophy and methods of science. (F) 69% .67

26. Books dealing with psychological problems or personal values are widely read and discussed. (T) 36% .77

40. Most of my associates believe the chief purpose of college is to provide training useful in one's vocation. (F) 35% .48

46. Long, serious philosophical discussions are common among the students. (T) 46% .74

60. It is usually quite easy to get a group decision here without much discussion. (F) 71% .54

66. A controversial speaker always stirs up a lot of student discussion. (T) 77% .69

80. There would be a capacity audience for a lecture by an outstanding philosopher or theologian. (T) 53% .74

86. Students here have very little interest in the analysis of value systems, and the relatively of societies and ethics. (F) 65% .86

100. Students here frequently debate social and political issues far into the night. (T) 54% .73

Scale 13: Student press for Social Conformity

Scale reliability: .63

4. Students who fail to develop social skills will soon feel out of place on this campus. (T) 45% .68

18. Articulateness and sophistication are highly respected by students. (T) 47% .57

		%	r
24.	Students here don't seem to care about their personal appearance. (F)	82%	.75
38.	Most students here have very little interest in developing well-rounded personalities. (F)	78%	.72
44.	Students think about dressing appropriately and interestingly for different occasions--classes, social events, sports, and other affairs. (T)	80%	.78
58.	Most students here have definite ideas about the kind of cultivated and sensitive person they wish to become. (T)	60%	.37
64.	Very few students are concerned about being properly groomed(F)	82%	.72
78.	The most popular students here are usually those who are least aware of social customs. (F)	92%	.40
84.	Ignorance of social customs is no handicap to the student here.(F)	64%	.82
98.	Students place high value upon the ability to interact effectively with others. (T)	81%	.73

Scale 14: Student press for Intellectualism

Scale reliability: .59

2.	Most students look for variety and novelty in summer jobs or activities. (T)	63%	.48
16.	Most of my associates admire their teachers. (T)	58%	.72
22.	Students often burlesque their instructors attitudes and mannerisms with wild caricatures. (F)	56%	.40
36.	Most students are grateful to the faculty for showing them a way of life worthy of imitation. (T)	37%	.66
42.	Students spend a lot of time planning their intellectual careers. (T)	38%	.70
56.	Very few students here are planning to do graduate work.(F)	68%	.63
62.	Most of my friends here don't do much except go to classes and study. (F)	84%	.23
76.	It is hard to find any students in the library on Friday nights. (F)	70%	.59

	%	r
82. Students respond enthusiastically to a colorful and dramatic speaker. (T)	90%	.55
96. Students here rarely get excited about a campus speaker. (F)	55%	.81

---

*Percentages shown represent percentages of a random sample (N=871) of examinees answering each item in keyed direction (T or F, shown in parentheses). The correlations shown represent correlations between item response and total scale scores. Scale reliabilities were estimated by Kuder-Richardson formula 20.

Table E-2

Intercorrelation Matrix for College Press Scales
(Based on mean press scores at 140 institutions)

Press Scale	Product-moment correlation coefficients Press Scale 1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Faculty Affiliation	--	28	70	29	-35	77	61	71	-42	23	49	53	06	62
2. Faculty Directiveness		--	47	32	-11	46	30	34	-12	38	29	29	13	42
3. Faculty Enthusiasm			--	76	-59	61	67	83	-50	55	69	74	-02	80
4. Faculty Achievement				--	-62	38	49	74	-57	77	63	74	-31	70
5. Faculty Compliance					---	-15	-55	-69	68	-43	-72	-71	33	-64
6. Faculty Supportiveness						---	44	56	-14	21	32	34	06	45
7. Faculty Humanism							---	75	-66	28	82	74	19	74
8. Faculty Independence								---	-61	48	77	80	-09	81
9. Faculty Vocationalism									---	-36	-70	-69	13	-59
10. Student Competition										---	44	54	-19	54
11. Student Estheticism											---	88	-02	83
12. Student Reflectiveness												---	-08	87
13. Student Social Conformity													---	09
14. Student Intellectualism														---

Table E-3

Covariance Analysis for Comparing Changes in Aspirations of 2,404 Men Exposed to Different College Press

Press scale used in classifying men into "strong" and "weak" press groups[a]	Number of men in each group[b] Weak press	Strong press	Press reported by group with higher adjusted final LOA	F-ratio
Factor I				
Reflectiveness (S) *	1137	1267	strong	7.32**
Estheticism (S) *	1185	1128	strong	24.48**
Intellectualism (S)	1376	1028	strong	7.01**
Independence (F)	1052	1262	strong	23.32**
Humanism (F)	1068	1246	strong	25.42**
Enthusiasm (F)	1181	1221	strong	46.45**
Achievement (F)	1043	1271	strong	5.90*
Vocationalism (F)	1119	1187	weak	8.48**
Compliance (F) *	1045	1269	weak	19.88**
Factor II				
Supportiveness (F)	1277	1037	strong	5.74*
Affiliation (F)	1285	1119	strong	23.58**
Factor III				
Social conformity (S)	1359	1045	ns	.41
Factor IV				
Competition (S)	1058	1256	ns	.23
Factor V				
Directiveness (F)	1020	1384	ns	.01

---

[a] Groups were determined according to whether the subject's score fell above or below interval limits most closely approximating the median press score for all subjects.

[b] N's do not total to 2,404 on some scales because some students failed to complete all items on the Inventory of College Characteristics.

*Results for these scales (Reflectiveness, Estheticism, and Compliance) should be interpreted with caution because of heterogeneity of regression among groups.

* p <.05

** p <.01

Table E-4

Covariance Analysis for Comparing Changes in Aspirations of 1,809 Women Exposed to Different College Press

Press scale used in classifying women into "strong" and "weak" press groups	Number of women in each group[a]		Press reported by group with higher adjusted final LOA	F-ratio
	weak press	strong press		
Factor I				
Reflectiveness (S)	976	833	ns	1.35
Estheticism (S)	959	801	ns	1.09
Intellectualism (S)	852	957	ns	1.36
Independence (F)	982	778	ns	2.18
Humanism (F)	742	1018	ns	.01
Enthusiasm (F)	864	943	ns	.49
Achievement (F)	809	951	ns	.99
Vocationalism (F)	903	845	ns	3.21
Compliance (F)	963	797	weak	7.35**
Factor II				
Supportiveness (F)	888	872	ns	.03
Affiliation (F)	969	840	strong	6.23*
Factor III				
Social conformity (S)	755	1054	ns	2.58
Factor IV				
Competition (S)	976	784	ns	.00
Factor V				
Directiveness (F)	818	991	ns	.57

[a] See footnotes a and b, Table E-3.

* $p < .05$

** $p < .01$

Appendix F

STUDENTS DEFERRING ENTRY INTO COLLEGE

In Fall, 1959 some 1,265 examinees, or five per cent of those responding to the initial survey, indicated that they had not enrolled in college immediately but planned to do so within the "next year or two." To ascertain the extent to which these students had carried out their plans, and some of the factors influencing their later decisions, a separate follow up was made of these students in June, 1961. The results of the subsequent survey are described in this appendix.

Responses were received from about 700, or 56 per cent, of these students. The response rate did not vary appreciably with aptitude level, and was almost identical for the two sexes.

College Enrollments During the Two Years Following High School Graduation

Slightly over half (52 per cent) of the 700 examinees indicated they had enrolled in college for one or more semesters during the two-year interval. Six out of every 10 of the men, but only four out of every 10 of the women said they had enrolled as full-time students. Also students with high aptitude test scores carried out their plans more often than those with low test scores. Thus among the examinees ranking in the top five per cent of ability, 84 per cent of the men and 64 per cent of the women reported they had entered college, while among those with test scores in the 64 to 79 percentile range only 58 per cent of the men and 36 per cent of the women said they had entered college.

In response to the question, "Do you plan to enroll in a college or university in Fall, 1961?" 76 per cent of the examinees with one semester or more of college said "Yes," while only 12 per cent of those who had not enrolled at any time during the two year interval said "Yes." Thus only about 44 per cent of the 700 students deferring college were enrolled as full-time students in Fall, 1961.

Reasons for Not Carrying Out Plans to Enter College

Students who had not entered college and who did not plan to do so in the future were asked to indicate the most important reasons for their subsequent decisions not to go to college. Among the 132 women who answered this question the percentages citing the most frequently given reasons were as follows:

	Percentage of women
Can't afford it	51
Decided to get married	38
Prefer to work rather than take time out for college	13
Decided to enter other, non-college training course	12
Don't need college education for my intended occupation	11
My parents haven't encouraged me	10
I lost my desire to enter college	9

Similar percentages for the 80 men answering this question also indicate the importance of limited financial resources as a deterrent to college attendance:

	Percentage of men
Can't afford it	78
Decided to enter other, non-college training course	18
Decided to get married	14
Prefer to work rather than take time out for college	8

The success of students in carrying out their plans to enter college after a delayed interval was also positively correlated with the amount of family financial resources they had reported two years earlier--a finding which is consistent with the tendency of these students to attribute their decisions to a lack of money. When all students deferring college entry were classified according to the low, medium, and high financial resources groups (families could pay $300 or less, $400-$700, or $800 or more per year, respectively) the percentages entering college during the two-year interval were 43, 60, and 69, respectively.

Half of the men who had not carried out their plans to enter college said they had been in military service during the two-year period, and nine out of every 10 of these men indicated that they would not fulfill their military obligations by Fall, 1961.

Attitudes toward College and Chosen Occupations

Although none of these students were asked whether they planned to enter college after Fall, 1961 it was possible to roughly estimate which students were deferring college for longer periods of time. Among the students who had not carried out their plans to enroll in college by the time of the follow up survey, only those not planning to go to college in the future were asked to give reasons for their decisions; the result was that 49 per cent of the men and 76 per cent of the women cited reasons for their decisions. It may therefore by inferred that a greater proportion of the men than of the women not carrying out their plans still planned to go to college at some future date. Consistent with this inference is the finding, shown in the first row of Table F-1, that 68 per cent of the men, while only 35 per cent of the women, not carrying out their plans stated that they believed their chosen career or occupation required a college education for satisfactory performance. Thus we estimate that about seven out of every 10 of the women not carrying out their plans by June, 1961 did not plan to enter college at a later date, while about five out of every 10 of the men deferring college this long did not plan to enroll in the future.

Table F-1 shows that the most notable differences in attitudes toward chosen careers or occupations occur among women who entered college after a delayed interval (carried out plans) and those who did not. Thus 20 per cent fewer of the latter group indicated that they believed their chosen careers would permit them "to realize their full potentialities" or would "provide adequate intellectual challenge." It may be noted that the largest differences among the responses of the two groups of men also occur on these two items, with those who did not carry out their plans being the more pessimistic about realizing these job rewards in their chosen occupations. At the same time there was little difference between the two groups of women, or between the two groups of men, in the proportions saying that they believed their chances of realizing these job rewards would be improved by completing college. In short, these results indicate that some of the students who deferred, but

later abandoned, plans to go to college had reservations about the appropriateness of their present careers or occupations and still believed that a college education would have been desirable.

Who Deferred College Entry

Questionnaire item	Percentage of students responding "Yes" to given statement			
	Women		Men	
	Carrying out plans to enroll in college (N = 119)	Not carrying out plans to enroll in college (N = 173)	Carrying out plans to enroll in college (N = 248)	Not carrying out plans to enroll in college (N = 161)
In your opinion does your chosen career or occupation require a college education for satisfactory performance?	85	55	86	68
Are you satisfied that your chosen career or occupation will:				
--provide interesting and satisfying work?	94	[illegible]	89	86
--permit you to realize your full potentialities?	64	44	70	56
--provide adequate intellectual challenge?	78	58	81	72
--provide adequate compensation and job security?	79	32	80	76
If you were to complete college, do you believe your chances of realizing the foregoing job rewards would be improved?				
--interesting and satisfying work	88	63	87	84
--realization of full potentialities	88	87	94	94
--receiving adequate intellectual challenge	89	86	93	89
--receiving adequate compensation and job security	84	72	91	87

Table F-1

Attitudes toward College and Chosen Careers Among Students Who Deferred College Entry

Questionnaire item	Percentage of students responding "Yes" to given statement			
	Women		Men	
	Carrying out plans to enroll in college (N = 119)	Not carrying out plans to enroll in college (N = 173)	Carrying out plans to enroll in college (N = 248)	Not carrying out plans to enroll in college (N = 163)
In your opinion does your chosen career or occupation require a college education for satisfactory performance?	85	35	86	68
Are you satisfied that your chosen career or occupation will:				
--provide interesting and satisfying work?	94	84	89	86
--permit you to realize your full potentialities?	64	44	70	56
--provide adequate intellectual challenge?	78	58	83	71
--provide adequate compensation and job security?	79	82	80	76
If you were to complete college, do you believe your chances of realizing the foregoing job rewards would be improved?				
--interesting and satisfying work	88	68	87	84
--realization of full potentialities	88	87	94	94
--receiving adequate intellectual challenge	89	86	91	89
--receiving adequate compensation and job security	84	72	91	87

Appendix G

QUESTIONNAIRES USED IN FOLLOW UP OF EXAMINEES

(Included if copies were available)

1. Study of Educational Plans of High School Graduates--used in Fall, 1959 survey.
2. Inventory of College Characteristics--used in June, 1961 survey of selected examinees at 140 colleges.
3. Study of College Retention among Talented Students--used in June, 1961 survey of all examinees who enrolled immediately in college.
4. Study of Educational Plans of Talented Students--used in June, 1961 survey of examinees deferring college entry.

STUDY OF EDUCATIONAL PLANS OF HIGH SCHOOL GRADUATES

Conducted by

NORTHWESTERN UNIVERSITY

under a grant from

THE UNITED STATES OFFICE OF EDUCATION

me. .... Age..........
(Last) (First) (Middle)

me address..

This questionnaire is part of a nationwide study being carried out to learn about the vocational and education plans of high school graduates who took the National Merit Scholarship Qualifying Test. Try to go through the estionnaire quickly but without skipping.

Answer exactly the way you feel, **for your individual replies will be kept confidential. When finished, mail the estionnaire in the attached self-addressed and stamped envelope.**

Most of the questions can be answered by a check in a box (like this: [✓]), or by circling a number. Disregard small numbers on the left of the boxes; they are only to aid in tabulating your answers.

6. Sex:
- 1☐ male
- 2☐ female

7. What are your educational plans for the future?
(Check the highest level of education you expect to complete.)
- 1☐ expect to complete non-college training course (business school, nurse's training, etc.)
- 2☐ expect to do some college work
- 3☐ expect to get a bachelor's degree
- 4☐ expect to do one year of graduate or professional study (M.A.)
- 5☐ expect to obtain professional degree (M.D., D.D.S., etc.)
- 6☐ expect to obtain Ph.D. or Ed.D. degree

8-12. Are you attending college this fall (1959)?
- 1☐ yes, I am a full-time student
- 2☐ yes, but only on a part-time basis (evening school, extension courses, etc.)
- 3☐ no, but I plan to enroll within the next year or two
- 4☐ no, but I am enrolled in another kind of training course (nurse's training, business college, religious training, etc.)
- 5☐ no, I am not attending college or going to any other school

If yes: What college are you attending?

....
(Name) (State)

9-12:

13-16. Have you *applied for* a loan at any college to help pay college costs?
- 1☐ no
- 2☐ yes

If yes: Did you *apply for* a loan under the governmental loan program?
(All loans under this program require the student to sign an oath and affidavit.)
- 3☐ no
- 4☐ yes

If yes: Will you have a federal loan during the coming year?
- 5☐ no
- 6☐ yes

If yes: What is the amount of your loan for the Freshman year?
(Circle the nearest number of hundreds of dollars; round 150 amounts upward to the next hundred.)

0 1 2 3 4 5 6 7 8 9 or more

17-18. If you needed help to pay college costs, would you apply for a federal loan?
- 1☐ yes
- 2☐ no

If no: Why not?
- 3☐ don't like idea of being indebted
- 4☐ don't like idea of an oath and affidavit
- 5☐ would never be able to pay it back

6☐ **others. Why?** ....

....

19. Mark the *one* number which stands for the *best* statement of the progress you have made in selecting your future occupation.

1☐ **I have made a definite and probably final decision**
2☐ **I have made a tentative but definite decision**
3☐ **I have narrowed the field to only a few possible choices**
4☐ **I have selected only some broad groups of occupations**
5☐ **I have made hardly any progress in selecting my future occupation**

20-21. Think of the occupation you plan to be in 15 years from now. Check this occupation below:

01☐ **architect**
02☐ **artist**
03☐ **business executive**
04☐ **creative writer**
05☐ **engineer**
06☐ **farm owner or manager**
07☐ **foreign service**
08☐ **housewife**
09☐ **journalist**
10☐ **lawyer**
11☐ **medical technician**
12☐ **military officer**
13☐ **minister**
14☐ **nurse**
15☐ **office worker (bookkeeper, secretary)**
16☐ **physician or surgeon**
17☐ **proprietor (self-employed business man, contractor, etc.)**
18☐ **salesman**
19☐ **scientific researcher**
20☐ **skilled tradesman (carpenter, electrician, etc.)**
21☐ **social worker**
22☐ **teacher, primary or secondary school**
23☐ **teacher, college or university**
24☐ **undecided**
25☐ **other. What?**..............................

22. Did you take the College Entrance Board Exams?

1☐ **yes**
2☐ **no**

23-26. Did you apply for admission to any college?

1☐ **no**
2☐ **yes. How many colleges did you apply to?**
(Circle the number of applications)

1 2 3 4 5 6 7 8 9 or more

If yes:* Were you accepted for admission to the college you *preferred?

3☐ **yes**
4☐ **no**

***If no:* Were you accepted for admission by any college at which you applied?**

5☐ **yes**
6☐ **no**

27. How many scholarships did you apply for a the time you graduated from high school? (Count the National Merit Scholarship as one scholarship application.)
(Circle the number of applications)

1 2 3 4 5 6 7 8 9 or more

28. At what colleges or to what donors did you apply for scholarship aid?
(Check those which apply)

1☐ **applied only to the National Merit Scholarship Corporation**
2☐ **privately supported colleges**
3☐ **publicly supported colleges**
4☐ **governmental agencies (federal, state, municipal)**
5☐ **scholarship competitions (e.g., General Motors Scholarship program, Westinghouse Science Talent Search, etc.)**

29. How many offers of scholarship aid have you received? (A "scholarship" is defined in this survey as any financial grant to a college applicant which does not involve repayment by the recipient in the form of work or later financial reimbursement.)
(Circle the number of offers received)

0 1 2 3 4 5 6 7 8 9 or more

30. Please indicate below the approximate value of the scholarship offer which was most attractive to you.
(Values are expressed as the number of dollars offered for the Freshman year only.)

1☐ **I did not receive any scholarship offer**
2☐ **less than $200**
3☐ **$200 - $399**
4☐ **$400 - $599**
5☐ **$600 - $799**
6☐ **$800 - $999**
7☐ **$1,000 - $1,199**
8☐ **$1,200 - $1,399**
9☐ **$1,400 or more**

31. Was the offer described in the preceding item restricted as to which college you could attend?

1☐ **yes, had to enroll in a particular college**
2☐ **yes, had to enroll in a college on an approved list**
3☐ **yes, had to enroll in a college in my state**
4☐ **no, was free to choose any college I wished**

32. Approximately how far is your home from the nearest college or university at which you could obtain training for your intended career?

1☐ **within commuting distance**
2☐ **less than 50 miles but not within commuting distance**
3☐ **51-100 miles**
4☐ **101-150 miles**
5☐ **more than 150 miles**

33. Course or curriculum taken in high school.
(Check the one which best describes your course.)
1☐ college preparatory
2☐ commercial
3☐ general
4☐ shop or technical
5☐ agricultural
6☐ other. What? ....

34. Did you receive any public recognition for scholastic achievement during your senior year in high school?
1☐ no, I did not
2☐ scholarship, Certificate of Merit award, or letter of commendation in National Merit program
3☐ won recognition in Westinghouse Science Talent Search, or other scholarship competitions
4☐ high school valedictorian or salutatorian
5☐ gold medal in National Honor Society
6☐ other recognition awards.

What? ....

....

35-37. After you learned the outcome of your participation in programs for identifying and recognizing scholastic achievement, did you have greater confidence in your ability to do college work?
1☐ yes
2☐ no

Did your parents or teachers encourage you to go to college more than before?
3☐ yes, my parents did
4☐ yes, my teachers did
5☐ no, they knew all along that I intended to
6☐ no, even though I was undecided, no one encouraged me any more than before

Did you place greater value upon intellectual achievement than you had before?
7☐ yes
8☐ no

38. How many *half* years (semesters) of mathematics did you take in high school (grades 9, 10, 11, 12)? (Include only the courses you have taken in algebra, geometry, trigonometry, and calculus.)
(Circle the appropriate number)

0 1 2 3 4 5 6 7 8 9 or more

39. Of the people your own age with whom you spend most of your free time, how many plan to go to college or are already going to college?
1☐ none
2☐ only a few
3☐ most of them
4☐ all of them

40. Estimate the percentage of your high school graduating class attending college this fall.
1☐ less than 20%
2☐ 21 - 40%
3☐ 41 - 60%
4☐ 61 - 80%
5☐ 81 - 100%
6☐ I have no idea

41. In your high school group, was it a sign of prestige and distinction to be a good student?
1☐ yes
2☐ no

42. How many older brothers and sisters do you have that are attending (or have attended) college?
0☐ none
1☐ one
2☐ two
3☐ three or more
4☐ does not apply, I have no older brothers or sisters

43. To what extent were you encouraged to go to college by the teachers or guidance counselors (advisors) in your high school?
1☐ not at all
2☐ some
3☐ quite a lot

44. Are you married or planning to be married within the next year?
1☐ yes
2☐ no

45. Estimate the amount of money your family could contribute each year to finance your college costs if you decided to go to college.
1☐ they couldn't afford to contribute any money
2☐ $100 to $300
3☐ $400 to $500
4☐ $600 to $700
5☐ $800 to $900
6☐ $1,000 to $1,400
7☐ $1,500 to $1,900
8☐ $2,000 to $2,500
9☐ more than $2,500

46-47. How does each of your parents feel about your attending college?

Father	*Mother*	
1☐	1☐	wants me to go
2☐	2☐	is indifferent
3☐	3☐	doesn't want me to go
4☐	4☐	parent deceased

48-49. How much formal education did your parents have?
(Check the highest level attained by each parent.)

Father	*Mother*	
0☐	0☐	some grade school
1☐	1☐	finished grade school
2☐	2☐	some high school
3☐	3☐	finished high school
4☐	4☐	some college
5☐	5☐	finished college
6☐	6☐	attended graduate school or professional school after college
7☐	7☐	attained professional degree (M.D., D.D.S., D.V.M., etc.)
8☐	8☐	attained Ph.D. degree
9☐	9☐	do not know

50. Occupation of father:
(Check the item which best applies.)

1☐ *profession* (lawyer, banker, doctor, teacher, minister, dentist, engineer)
2☐ *owns or manages business* (store, gas station or garage, photography, barber shop, insurance agency, hotel or cafe, repair shop, newspaper, etc.)
3☐ *office work* (bookkeeper, cashier, postal clerk, etc.)
4☐ *sales* (insurance, real estate, retail store, etc.)
5☐ *owns or manages farm*
6☐ *skilled tradesman* (carpenter, electrician, machinist)
7☐ *factory worker* (laborer, farm laborer, janitor, mine laborer)
8☐ other occupations. What? ....

....

51. My family's gross annual income is approximately:

1☐ less than $5,000
2☐ $5,000 - $6,999
3☐ $7,000 - $8,999
4☐ $9,000 - $10,999
5☐ $11,000 - up
6☐ no reply; I regard this information as confidential
7☐ I don't know

52. Estimate the number of books in your home.

1☐ less than 50
2☐ 50 - 99
3☐ 100 - 149
4☐ 150 - 199
5☐ 200 - 249
6☐ 250 - 299
7☐ 300 or more

53. With whom do you live?

1☐ father only
2☐ mother only
3☐ both parents
4☐ others. Who? ....

ANSWER QUESTIONS BELOW IF YOU ARE ATTENDING COLLEGE THIS FALL. NON-ATTENDERS SKIP TO QUESTION 68-69.

54-56. Will you have a part-time job while attending college this fall?

1☐ no
2☐ yes

If yes: How much do you expect to earn during your Freshman year?
(Circle the nearest number of hundreds of dollars.)

1 2 3 4 5 6 7 8 9 or more

About how much time do you expect to work per week at a paying job?

3☐ less than 10 hours
4☐ 10-20 hours
5☐ more than 20 hours

57-58. Have you obtained a non-government loan to help pay college costs?

1☐ no
2☐ yes

If yes: What is the amount of this loan for the Freshman year?
(Circle the nearest number of hundreds of dollars.)

1 2 3 4 5 6 7 8 9 or more

59-62. Do you hold a Freshman scholarship for the present school year?

0☐ no
1☐ yes

If yes: Please indicate the source and amount of your scholarship
(round $50 amounts upward to next hundred)

(60)
Source

2☐ college or university scholarship
3☐ state governmental agency (state scholarship such as those in Calif., Ill., N.Y.)
4☐ federal governmental agency (Naval ROTC, etc.)
5☐ business or industry (General Motors Scholarship, etc.)
6☐ other. What? ....

....

(61)
Amount for Freshman year

0☐ less than $50
1☐ $100
2☐ $200
3☐ $300
4☐ $400
5☐ $500
6☐ $600
7☐ $700
8☐ $800
9☐ $900
X☐ $1000 or more

Could you use the scholarship described above at any college?
(62)

7☐ yes, any college I chose
8☐ anywhere in the state
9☐ any college from an approved list
X☐ no, had to go to a particular college

63. What is the approximate distance from your home to your college?

0☐ 0-50 miles	5☐ 751-1,000
1☐ 51-100	6☐ 1,001-1,250
2☐ 101-250	7☐ 1,251-1,500
3☐ 251-500	8☐ 1,501-1,750
4☐ 501-750	9☐ more than 1,750

64. What were the most important considerations you had in mind when you were deciding which school to attend?
(Check the two considerations that were most important to you.)
0☐ low tuition costs and living expenses
1☐ closeness to home
2☐ high educational standards
3☐ courses of study offered
4☐ chances of a scholarship
5☐ religious character of the school
6☐ chances of getting admitted
7☐ people I know who went to it
8☐ high prestige of college
9☐ small size of student body
X☐ work opportunities
12☐ other. What? ....

65-66. What will your probable major field of study be in college? Check one.
00☐ anthropology
01☐ architecture
02☐ art
03☐ biological sciences
04☐ chemistry
05☐ classical languages (Latin, Greek)
06☐ economics
07☐ education (elementary or secondary school teaching)
08☐ engineering
09☐ English
10☐ foreign languages (German, etc.)
11☐ geography
12☐ geology
13☐ history
14☐ home economics
15☐ journalism
16☐ mathematics
17☐ military science
18☐ music
19☐ philosophy
20☐ physical education
21☐ physics
22☐ political science
23☐ pre-dental
24☐ pre-medical
25☐ pre-law
26☐ psychology
27☐ sociology
28☐ speech
29☐ theology or religion
30☐ undecided
31☐ other. Specify ....

....

67. Are you a commuter or a resident at the college you attend?
1☐ resident
2☐ commuter

COLLEGE-ATTENDERS SKIP NOW TO QUESTION 72.

IF YOU ARE *NOT* ATTENDING COLLEGE THIS FALL, ANSWER QUESTIONS BELOW.

What is your present occupation? ....

....

68-69. Would you go to college if you had more money?
1☐ yes
2☐ no
3☐ undecided

If yes: How much more money would you require per year?
(Circle the amount to the nearest hundreds of dollars)

1 2 3 4 5 6 7 8 9 or more

70. Check the most important reason why you are not going to college.
0☐ wanted to get married
1☐ couldn't afford it
2☐ most of my friends aren't going to college
3☐ my grades aren't high enough
4☐ don't think I would fit in with college students
5☐ my parents haven't encouraged me
6☐ don't need a college education for my intended occupation
7☐ plan to fulfill military obligations first
8☐ couldn't get admitted to the college I wanted to attend
9☐ illness
X☐ other. Why? ....

....

71. When did you make your decision not to go to college immediately after high school?
1☐ never expected to go
2☐ pre-high school
3☐ as a freshman
4☐ as a sophomore
5☐ as a junior
6☐ as a senior
7☐ post-high school
8☐ undecided

72. We plan to survey students again next year. Would you be willing to reply to a brief follow-up at that time?
1☐ yes
2☐ no

73. Any questionnaire of this kind leaves a lot unsaid. If you have any further comments about any of the topics covered, or any other observations you may wish to make, won't you please jot them down on the back side of the questionnaire.
THANK YOU VERY MUCH.

INVENTORY OF COLLEGE CHARACTERISTICS

Form OE-61

The purpose of this inventory is to obtain information about the ways in which college environments differ from one another. The statements below describe the kinds of courses emphasized, the characteristics of teachers and courses, the activities and attitudes of students, etc. You are to decide which statements are characteristic of your college or university and which are not. Your answers should tell us what you believe the *college* environment is like rather than what you might personally prefer.

You will find many statements that are partly true and partly false as descriptions of your college or university. In these cases you are to decide whether the statement is *mostly true or mostly false* of the college environment as you have observed it. In a few cases you may not have had an opportunity to directly observe whether the characteristic described is true or false, and for these items you are asked to give your impressions on the basis of conversations with other students or with teachers. To be sure your responses can give only an approximate description of your college. In many instances you will feel that your responses should be qualified, but please make only one response to each item. Previous experience with this type of inventory has shown that student observers at the same college often exhibit good agreement in their descriptions, and that the descriptions of various colleges often differ markedly from one another.

Your responses will be kept confidential.

DIRECTIONS: Fill in the blanks at the top of the special answer sheet. Be sure to write in the name of the college you are describing. If you have attended more than one college, please describe the institution in which you *first enrolled* as a full-time college student. Then, as you read each statement in this booklet *circle* the T or F for the corresponding item on the answer sheet.

You should *circle*

T — when you believe the statement is generally TRUE or, mostly true, as a description of your college.

F — when you believe the statement is generally FALSE, or mostly false, as a description of your college.

PLEASE DO NOT OMIT ANY ITEMS

When you have completed the inventory, and filled in *both* sides of the answer sheet, please *discard* this booklet, and return only the answer sheet and the write-in questionnaire in the enclosed self-addressed, stamped envelope.

1. Professors frequently go out of their way to establish friendly relations with the students.
2. Most students look for variety and novelty in summer jobs or activities.
3. Instructors seldom outline the day's lecture or discussion at the beginning of the class period.
4. Students who fail to develop social skills will soon feel out of place on this campus.
5. The campus atmosphere does not seem to be very stimulating for faculty members.

6. The student newspaper rarely carries articles intended to stimulate discussion of philosophical or ethical matters.
7. The faculty is outstanding for the emphasis it places on student scholarship and research.
8. Students here tend to avoid courses which deal with broad human values or life goals.
9. Term papers and course projects often rate an A even though they do not fulfill the letter of the instructor's assignment.
10. There is a great deal of rivalry for grades among students.

11. Instructors often discuss the students' goals with them and try to help them discover their special talents.
12. Professors seem to think that the chief purpose of a college education is to provide technical training.
13. Very few of the professors here try to get students interested in the humanities.
14. There are many facilities and opportunities for individual creative activity.
15. Faculty members are available to students only during scheduled office hours.

16. Most of my associates admire their teachers.
17. It is hard to prepare for examinations because students seldom know what will be expected of them.
18. Articulateness and sophistication are highly respected by students.
19. Lectures are frequently routine and duplicate material in the text.
20. There is very little student interest in the philosophy and methods of science.

21. An open display of emotion would embarrass most professors.
22. Students often burlesque their instructor's attitudes and mannerisms with wild caricatures.
23. It is easy to take clear and systematic notes in courses here.
24. Students here don't seem to care about their personal appearance.
25. Many of the instructors seem bored with their teaching assignments.

26. Books dealing with psychological problems or personal values are widely read and discussed.
27. The faculty shows very little interest in the methods and philosophy of science.
28. Student rooms are more likely to be decorated with pennants and pin-ups than with paintings, carvings, mobiles, fabrics, etc.
29. The faculty often permits students to deviate somewhat from published curriculum requirements in their course work.
30. The competition for high achievement is intense.

31. The faculty often tries to show qualified students how they can become creative or productive workers in their field of study.
32. The academic atmosphere is practical, emphasizing efficiency and usefulness.
33. Student interest in understanding and criticizing important works in art, music, and drama is encouraged by the faculty.
34. The faculty is usually too busy to invent ways of encouraging initiative among students.
35. The professors seem to have little time for conversation with the students.

36. Most students are grateful to the faculty for showing them a way of life worthy of imitation.
37. In most courses students do not know what the topic of the next lecture will be because the lecturer rarely announces it.
38. Most students here have very little interest in developing well-rounded personalities.
39. Faculty members put a lot of energy and enthusiasm into their teaching.
40. Most of my associates believe the chief purpose of college is to provide training useful in one's vocation.

41. The faculty here takes a personal interest in students and their work.
42. Students spend a lot of time planning their intellectual careers.
43. Instructors clearly explain the goals and purposes of their courses.
44. Students think about dressing appropriately and interestingly for different occasions—classes, social events, sports, and other affairs.
45. Instructors really get students interested in their subjects.

46. Long, serious philosophical discussions are common among the students.
47. Professors frequently encourage qualified students to do graduate work.
48. When students get together they often talk about trends in art, music or the theater.
49. Instructors are relatively permissive when it comes to enforcing rules regarding course prerequisites.
50. The high calibre of students here puts a lot of pressure on one.

51. Students having difficulty with their courses can easily get special tutoring or counsel from the department's instructors.
52. The college offers many really practical courses designed to prepare the student for his occupation.
53. Faculty advisors seem unaware that a well-rounded program of study includes courses in the arts and humanities.
54. There is little opportunity here for pursuing independent study under the supervision of faculty members.
55. The professors really talk *with* the students, not just at them.

56. Very few students here are planning to do graduate work.
57. Teachers usually distribute, or have students buy, a course syllabus which summarizes the material to be covered during the term.
58. Most students here have definite ideas about the kind of cultivated and sensitive person they wish to become.
59. The outstanding traits of the faculty are their dedication to, and enthusiasm for, their work.
60. It is usually quite easy to get a group decision here without much discussion.

61. Instructors seem personally interested in their students.
62. Most of my friends here don't do much except go to classes and study.
63. Most courses are meticulously organized and progress systematically from topic to topic.
64. Very few students are concerned about being properly groomed.
65. Professors typically exhibit great interest and enthusiasm in their subjects.

66. A controversial speaker always stirs up a lot of student discussion.
67. Personality, pull, and bluff get students through many courses.
68. Humanities courses are often elected by students majoring in other areas.
69. Instructors go out of their way to be tolerant of students who do not comply with course requirements.
70. Most students here are quite aware of the competition to get into graduate school.

71. Teachers are sensitive to student complaints and grievances and frequently try to remedy the situation.
72. Very few of the courses here will be useful to students who go into business or industry.
73. Instructors here have very little interest in drama or the arts.
74. The faculty rarely encourages students to undertake independent projects or theses.
75. As a general rule students here almost never get to know their teachers well enough to count them as personal friends.

76. It is hard to find any students in the library on Friday nights.
77. The faculty tries hard to avoid giving lectures in class so that students can participate extensively in class discussions.
78. The most popular students here are usually those who are least aware of social customs.
79. Many of the professors here seem discouraged about the job rewards associated with college teaching.
80. There would be a capacity audience for a lecture by an outstanding philosopher or theologian.

81. Instructors are typically friendly and sympathetic in manner.
82. Students respond enthusiastically to a colorful and dramatic speaker.
83. Assignments are usually clear and specific, making it easy for students to plan their studies effectively.
84. Ignorance of social customs is no handicap to the students here.
85. Many lectures are delivered in a monotone with little inflection or emphasis.

86. Students here have very little interest in the analysis of value systems, and the relativity of societies and ethics.
87. The student can pass most courses just by learning what's in the textbook.
88. There is a lot of interest here in student theatrical groups.
89. Frequent tests are given in most courses.
90. Many students here are content just to get by.

91. Professors rarely try to spare the student's feelings when giving negative evaluations.
92. Education here tends to make students more practical and realistic.
93. Instructors here continually go out of their way to try to liberate the student from his prejudices and provincialisms.
94. In class discussions, papers, and exams the main emphasis is on the development of critical judgment.
95. The faculty keeps pretty much to itself and rarely fraternizes with students.

96. Students here rarely get excited about a campus speaker.
97. Teachers here rarely attempt to summarize the day's lecture at the end of the period.
98. Students place high value upon the ability to interact effectively with others.
99. It is obvious that the teachers here have fallen in love with the search for knowledge.
100. Students here frequently debate social and political issues far into the night.

101. There aren't very many courses here which demand excellent performance by all students.
102. There is a lot of interest here in poetry, music, painting, sculpture, architecture, etc.
103. Teachers usually mark down students who complete assignments late.
104. The competition for special honors is very rough.
105. Instructors here are sometimes sarcastic in class.

106. Very few instructors try to give the student the practical training he will need in his career field.
107. The faculty frequently encourages the student to take courses in the humanities.
108. A well reasoned report can rate an A grade here even though its viewpoint is opposed to the professor's.
109. The professors are really skillful at getting students to work to the limit of their capacities.
110. Concerts and art exhibits always draw big crowds of students.

111. Students absent from class must present excuses when they return.
112. There are relatively few really capable students here.
113. Counseling and guidance services are really personal, patient, extensive.
114. Very few of the courses here aim at preparing the student for his vocation.
115. Professors here show no interest in tracing the sources of their specialized field of study to philosophical or humanistic movements in the history of ideas.

116. The faculty tends to be critical of unconventional and novel ideas in papers and reports.
117. Teachers here expect, and usually get, excellence in the academic performance of students.
118. A student who insists on analyzing and classifying art and music is likely to be regarded as a little odd.
119. Instructors often waive requirements for admission to their courses.
120. Students here attach little importance to how well they do relative to others in their class.

121. Instructors are sometimes careless about acquainting students with curriculum requirements.
122. The academic atmosphere is not very helpful to the student who wants to specialize in business, engineering management or other practical affairs.
123. The faculty discourages students from specializing in their major field during the first two years.
124. The faculty feels free to go into absolutely anything in trying to encourage students to develop their interests.
125. Instructors typically avoid presenting more material than the student can handle.

126. Most students here prefer to take only courses closely related to their specialized fields of study.
127. Faculty advisors are very reluctant to approve any exceptions in the curriculum requirements for graduation.
128. Good grades are of little concern to most students here.
129. The faculty expects the undergraduate to get by almost completely on his own resources.
130. Most instructors are very practical and pragmatic in their approach to college training.

131. Professors who are true scholars in the humanities would feel out of place among faculty members here.
132. Professors here conscientiously attempt to cover the course syllabus and do not encourage departures from the planned course of study.
133. The faculty frequently encourages students to enroll in the Honors Program or in similar advanced courses of study.
134. A lecture by an outstanding poet or dramatist would draw very few students here.
135. The faculty usually demands strict compliance with all course requirements.

136. Very few students here feel they are in competition with each other.
137. Faculty advisors usually restrict appointments for planning study programs to one or two periods during the year.
138. Most professors here refute the idea that the main purpose of college education is to prepare the student for his vocation.
139. All students here are expected to take numerous elective courses in English literature, history, or philosophy.
140. Many instructors "play it by ear" adjusting assignments and projects to the individual student's interests.

STUDY OF COLLEGE RETENTION AMONG TALENTED STUDENTS

Conducted by

NORTHWESTERN UNIVERSITY **Code Number..........**

under a grant from

THE UNITED STATES OFFICE OF EDUCATION

This is part of a nationwide survey dealing with the talented student's persistence in college. Your individual replies will be kept confidential. When finished, mail the questionnaire in the enclosed self-addressed and stamped envelope.

1. Name...
(Last) (First) (Middle)

2-4. Present home address...

5. Name of college or university you last attended...

...
(City) (State)

6. Is the above the same institution in which you first enrolled during the school year 1959-60?

1 .... Yes 2 .... No

7. Check below each term in which you were enrolled in a college or university as a full-time student:

1959-60	**1960-61**
0 .... First semester	**5 .... First semester**
1 .... Second semester	**6 .... Second semester**
2 .... First quarter	**7 .... First quarter**
3 .... Second quarter	**8 .... Second quarter**
4 .... Third quarter	**9 .... Third quarter**

8. What is your present educational status?

- **1 .... I am continuing as a full-time college student during the regular academic sessions**
- **2 .... I am continuing but as a part-time college student**
- **3 .... I have withdrawn from college and do not expect to return**
- **4 .... I have withdrawn from college but plan to return later**

9-11. Has your college or university, at any time, given you:

(a) A scholarship? 1 .... Yes 2 .... No
(b) A student loan? 1 .... Yes 2 .... No
(c) Part-time employment? 1 .... Yes 2 .... No

12-13. If you held one or more scholarships (of any type), how long did you receive scholarship aid? (Circle the appropriate number of semesters *or* quarters.)

(a) 1 2 3 4 semesters
(b) 1 2 3 4 5 6 quarters

14. What was the cash value per year of all *scholarships* you held during the academic year 1960-61? (Round $50 amounts upward to next hundred.)

0 .... No scholarship
1 .... $100 or less
2 .... $200
3 .... $300
4 .... $400
5 .... $500
6 .... $600
7 .... $700
8 .... $800
9 .... $900
x .... $1,000-$1,200
12 .... $1,300 or more

15. What was the cash value per year of all *loans* you received to help pay college costs during the academic year 1960-61? (Round $50 amounts upward to next hundred.)

0 .... No loan
1 .... $100 or less
2 .... $200
3 .... $300
4 .... $400
5 .... $500
6 .... $600
7 .... $700
8 .... $800
9 .... $900
x .... $1,000 or more

PLEASE CONTINUE ON BACK SIDE

16. Using a system of grade equivalents where A=4, B=3, C=2, D=1, F=0, what was your grade-point average for the *last semester or quarter* in which you were enrolled in college?

1 .... 3.51 - 4.00
2 .... 3.01 - 3.50
3 .... 2.51 - 3.00
4 .... 2.01 - 2.50
5 .... 1.51 - 2.00
6 .... 1.01 - 1.50
7 .... 1.00 or below

17. What are your educational plans for the future? (Check the highest level of education you expect to complete.)

1 .... I expect to complete noncollege training course (business school, nurse's training, etc.)
2 .... I expect to complete three years of college
3 .... I expect to get a bachelor's degree
4 .... I expect to do one year of graduate or professional study (M.A.)
5 .... I expect to obtain a professional degree (M.D., D.D.S., LL.B., etc.)
6 .... I expect to obtain a Ph.D. or other academic doctorate degree

18. If you have transferred or are planning to transfer this fall from the institution of your original registration to another college, what were the *one* or *two* most important reasons for transfer?

1 .... Dissatisfied with the faculty
2 .... Dissatisfied with the curriculum offerings
3 .... Dissatisfied with student associates
4 .... My curricular interests changed
5 .... Wished to attend less expensive institution
6 .... I was not interested in what I was studying
7 .... My grades were too low to continue
8 .... Wanted to be in a smaller institution
9 .... Wanted to be in a larger institution
x .... I wanted to be nearer home
12 .... Enrolled in a junior college and completed my course

Other..

....

19. Were you ever placed on probation in college for unsatisfactory academic performance?

1 .... No **2 .... Yes**

20. If yes: were you able to improve your grades sufficiently to be taken off probation?

3 .... Yes **4 .... No**

21-22. If you discontinued college, check below the *one* or *two* most important reasons for withdrawing from college:

01 .... Dismissed for academic failure
02 .... Placed on probation for academic reasons
03 .... I was discouraged by low grades
04 .... Financial difficulties (self)
05 .... Financial difficulties (family)
06 .... Dissatisfied with college faculty
07 .... Dissatisfied with curriculum offerings
08 .... Dissatisfied with student associates
09 .... I found college work too difficult
10 .... I lacked interest in my studies
11 .... I preferred to take a full-time job
12 .... I am married or plan to be married soon
13 .... I was needed at home
14 .... Military service (was drafted)
15 .... Military service (enlisted)
16 .... Illness or physical disability (self or family)

Other..

....

COMMENTS (write in):

STUDY OF EDUCATIONAL PLANS OF TALENTED STUDENTS

Conducted by

Northwestern University

Code No.____________

under a grant from

The United States Office of Education

This is part of a nationwide survey being carried out to study the educational progress of high school graduates who took the National Merit Scholarship Qualifying Test. Your individual replies will be kept confidential. When finished, mail the questionnaire in the enclosed self-addressed and stamped envelope.

1. Name____

2. Present home address__________________________________

3-4. Have you at any time during the last two years enrolled as a full-time student at a college or university?

1 __ No. 2 __ Yes. If yes, what college or university?

(Name)____________________(City)____________________(State)

5-6. Do you plan to enroll as a full-time student at a college or university in Fall, 1961?

1 __ No. 2 __ Yes. If yes, what college or university?

(Name)____________________(City)____________________(State)

(Fill in only if different from college named above)

7. If you have already attended college, check below each term in which you were enrolled in a college or university as a full-time student:

1959-60	1960-61
0 __ First semester	5 __ First semester
1 __ Second semester	6 __ Second semester
. . . .	. . . .
2 __ First quarter	7 __ First quarter
3 __ Second quarter	8 __ Second quarter
4 __ Third quarter	9 __ Third quarter

8. In Fall, 1959 you indicated you planned to enroll in college within the next year or two. If you have not enrolled in college and do not plan to in the future, check below the one or two most important reasons why you have decided not to go to college.

0 __ can't afford it
1 __ decided to get married
2 __ don't need college education for my intended occupation
3 __ decided to enter other, noncollege, training course
4 __ my grades aren't high enough
5 __ couldn't get admitted to the college I wanted to attend
6 __ I lost my desire to enter college
7 __ prefer to work rather than take time out for college
8 __ decided to remain in military service
9 __ most of my friends are not going to college
X __ my parents haven't encouraged me to go
Other______________________________
____

PLEASE CONTINUE ON BACK SIDE

9. Have you been in military service at any time during the last two years?
1 __ No. 2 __ Yes. If yes, how long?____________. Have you fulfilled, or will you fulfill your military obligations by Fall, 1961? 1 __ Yes. 2 __ No.

10. If you have not entered college, what was your occupation during the period January to June, 1961?

____

11. What career or occupation do you plan to pursue during your adult life?

____

12. Are you satisfied that your chosen career or occupation will:

(a) provide interesting and satisfying work? Yes __; No __; Undecided __
(b) permit you to realize your full potentialities? Yes __; No __; Undecided __
(c) provide adequate intellectual challenge? Yes __; No __; Undecided __
(d) provide adequate compensation and job security? Yes __; No __; Undecided __

13. In your opinion does your chosen career or occupation require a college education for satisfactory performance? Yes __; No __; Undecided __

14. If you were to complete college, do you believe your chances of realizing the foregoing job rewards would be improved or unchanged?

	chances would be:
(a) interesting and satisfying work	Improved __; Unchanged __
(b) realization of full potentialities	Improved __; Unchanged __
(c) receiving adequate intellectual challenge	Improved __; Unchanged __
(d) receiving adequate compensation and job security	Improved __; Unchanged __

COMMENTS (write in):